

3vz-fe into Mk2 Mr2 idiots wiring guide

Author-Paul Woods For Technical Reference

DISCLAIMER:

I will try to document the whole wiring conversion as accurately as i can,however it must be understood that there are wiring revisions across all years of V6 camry and also Mr2's...in particular mk2 NA's and mk2 Turbos differ in quite a few areas,there are also differences within NA engines such as the 3s-ge and 3s-fe...so its important to do the research yourself,double check everything and use this write up as a GUIDE ONLY.If you were to follow this guide blindly and there was a wiring difference it could result in a fire or permanent damage to your ECU or wiring harness.Paul Woods/Woodsport and Twobrutal.co.uk cannot be held responsible for any damage that may or may not occur.Hate saying this stuff but we have to cover our backs against the muppets out there!

Also it may be necessary to add information to this guide as time goes on,basically although ive wired up many v6's into both turbo and NA models DO NOT take this guide as gospel ...with that out of the way let the fun begin.

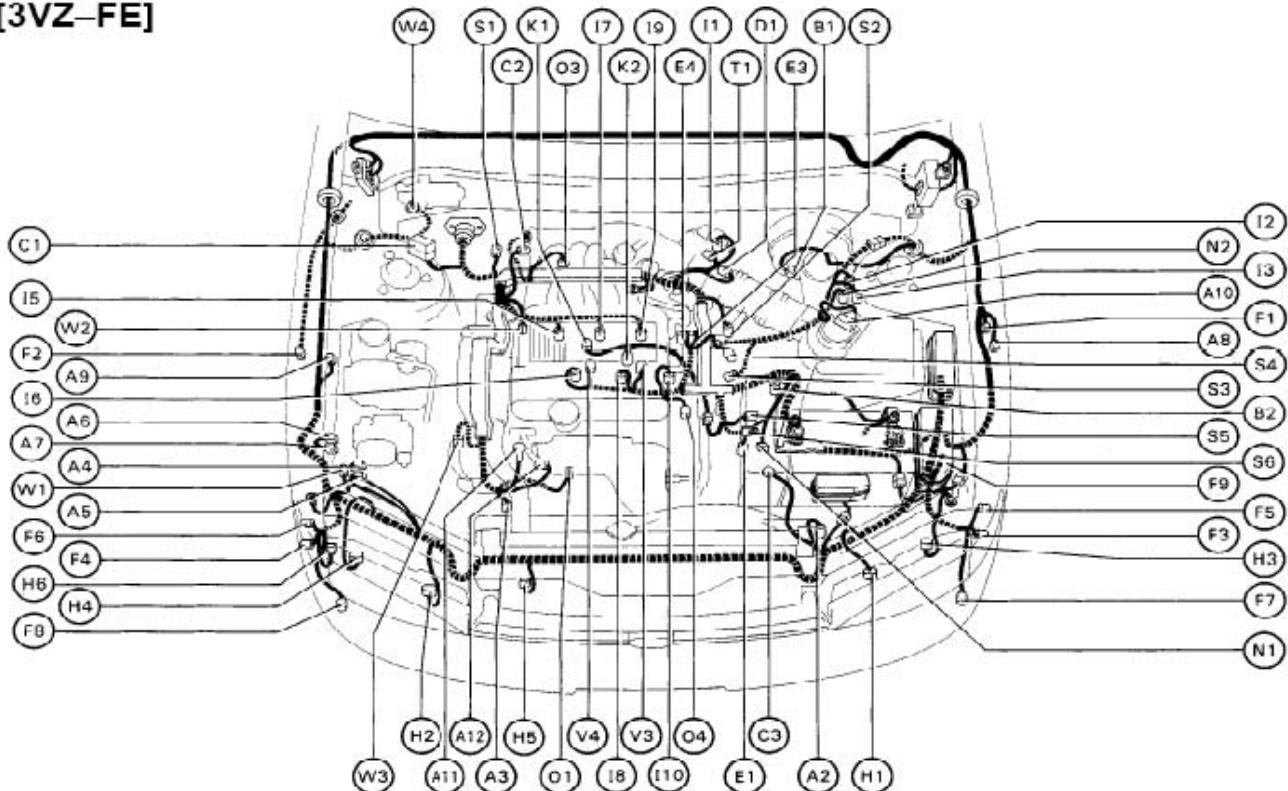
Removing the harness from the camry:

Its important to remove the correct parts of the harness from the camry donor vehicle so that nothing gets damaged or left behind.Also theres many parts of the engine bay harness that are not needed that can be quickly cut through and binned.If in any doubt what needs keeping and what doesnt then ask.

Here is a layout of the wiring harness in a V6 camry,there are some differences here between a UK spec and US spec but the general jist is the same,this is a US diagram.

Position of Parts in Engine Compartment

[3VZ-FE]

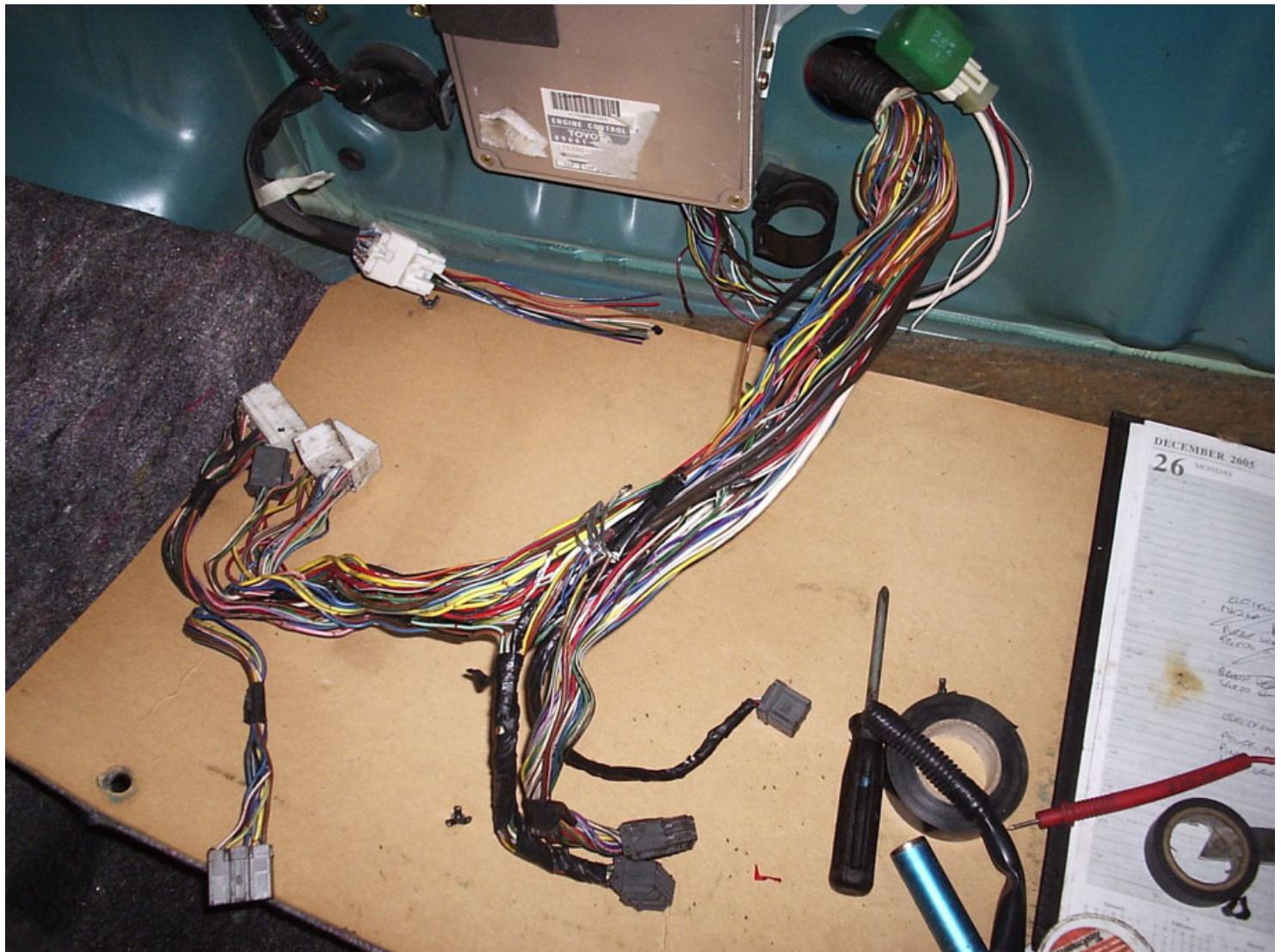


The location of the ECU/diagnostic connector (C1) and a few other components in this diagram are mirrored because its a LHD car,a UK spec car has the ECU main harness going into the NS of the engine bay firewall. Note the fusebox at F9, this is the same on UK cars, we unplug the engine harness here as well as unplugging all of the connectors at the ECU which is behind the glovebox. There will also be other connectors behind the glovebox that aren't going to the ECU that need to be unplugged. Basically just unplug from around the glovebox area until it will pull through into the engine bay. There is also a power feed connector going to the dash that runs through the OS part of the firewall, unplug this too.

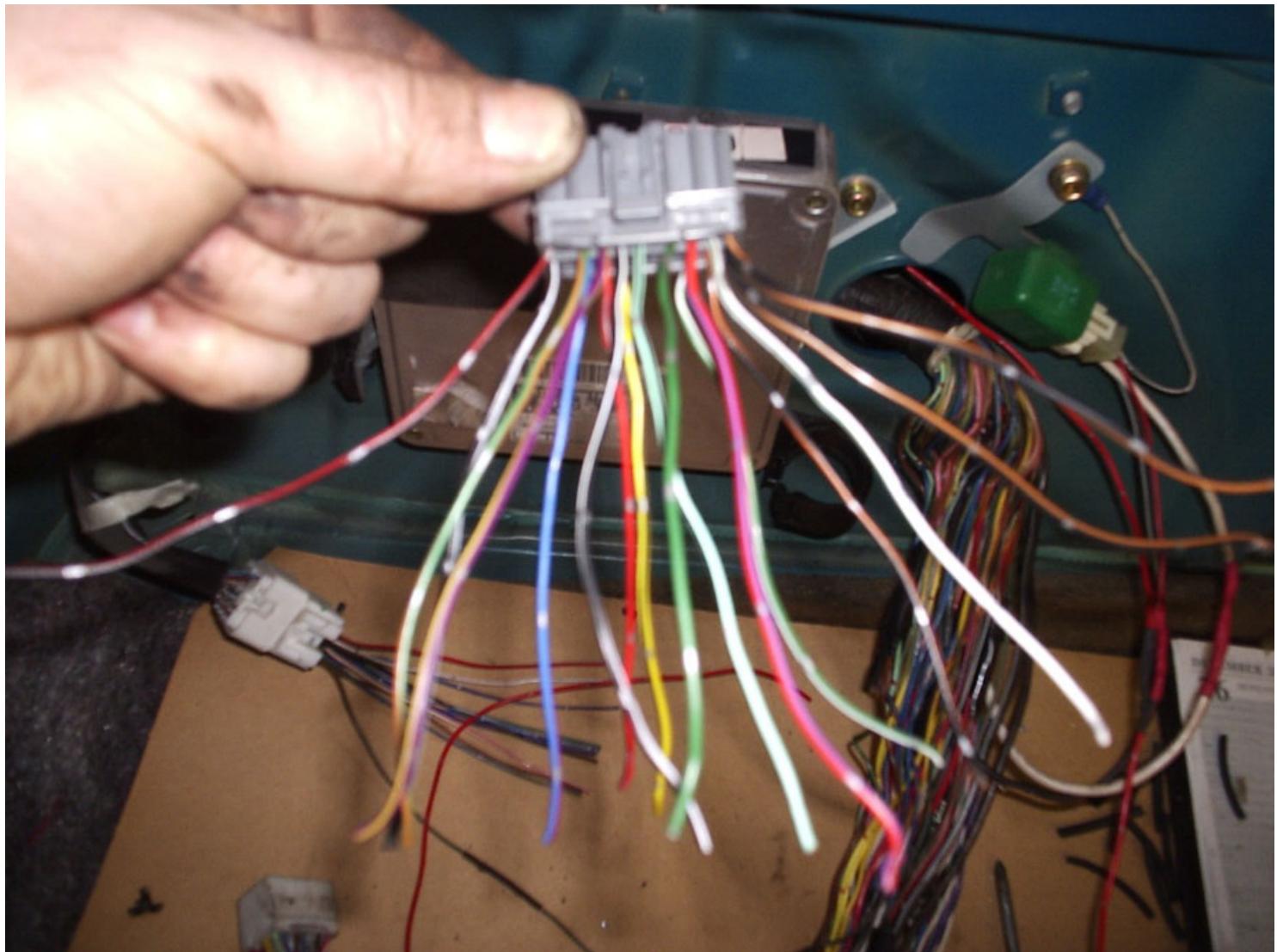
So to recap, unplug all of the connectors from fusebox F9, all of the connectors from behind the glovebox and the ECU, and also the dash power feed on the OS of the firewall.

Preparation of the V6 harness for wiring:

The V6 harness needs its sheathing removing and all wires exposing where it enters the boot, remove all tape and also remove the square rubber grommet that used to attach to the camry firewall like this...



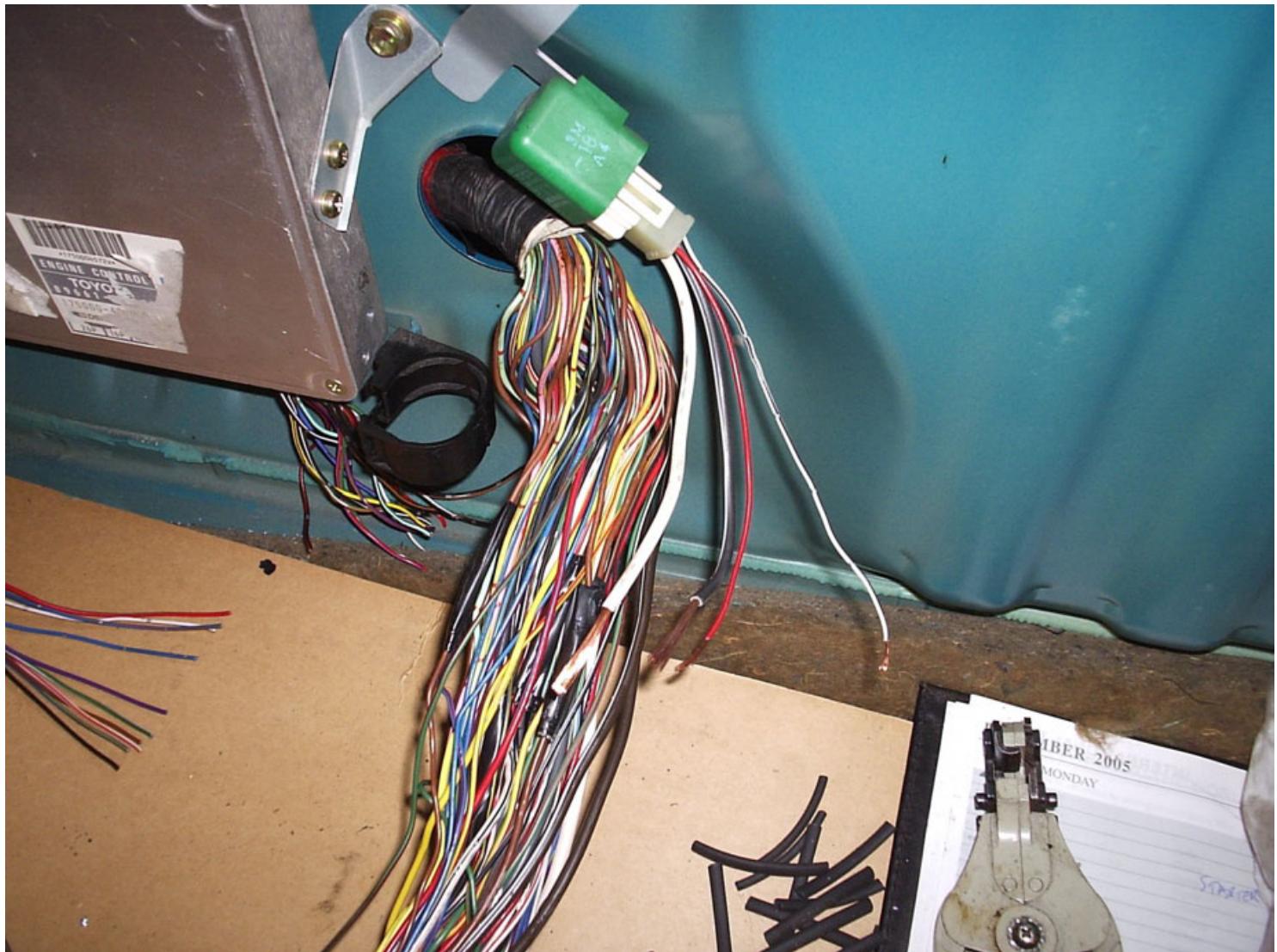
So you should have something resembling the above, the white plug at the top of the picture is all that's left over from the 3s-fe engine harness, on a 3s-ge or gte engined car there will be another grey plug as well. All it means is that for the 3s-fe cars the extra wires are coming from the fusebox instead of the boot area but their destination onto the v6 loom will be the same. In the pic above you can see 3 ECU plugs on the right and 4 V6 body harness plugs on the left. Also you can see the 4th ECU plug that's plugged into the ECU with all its wires cut. These wires are pictured below....



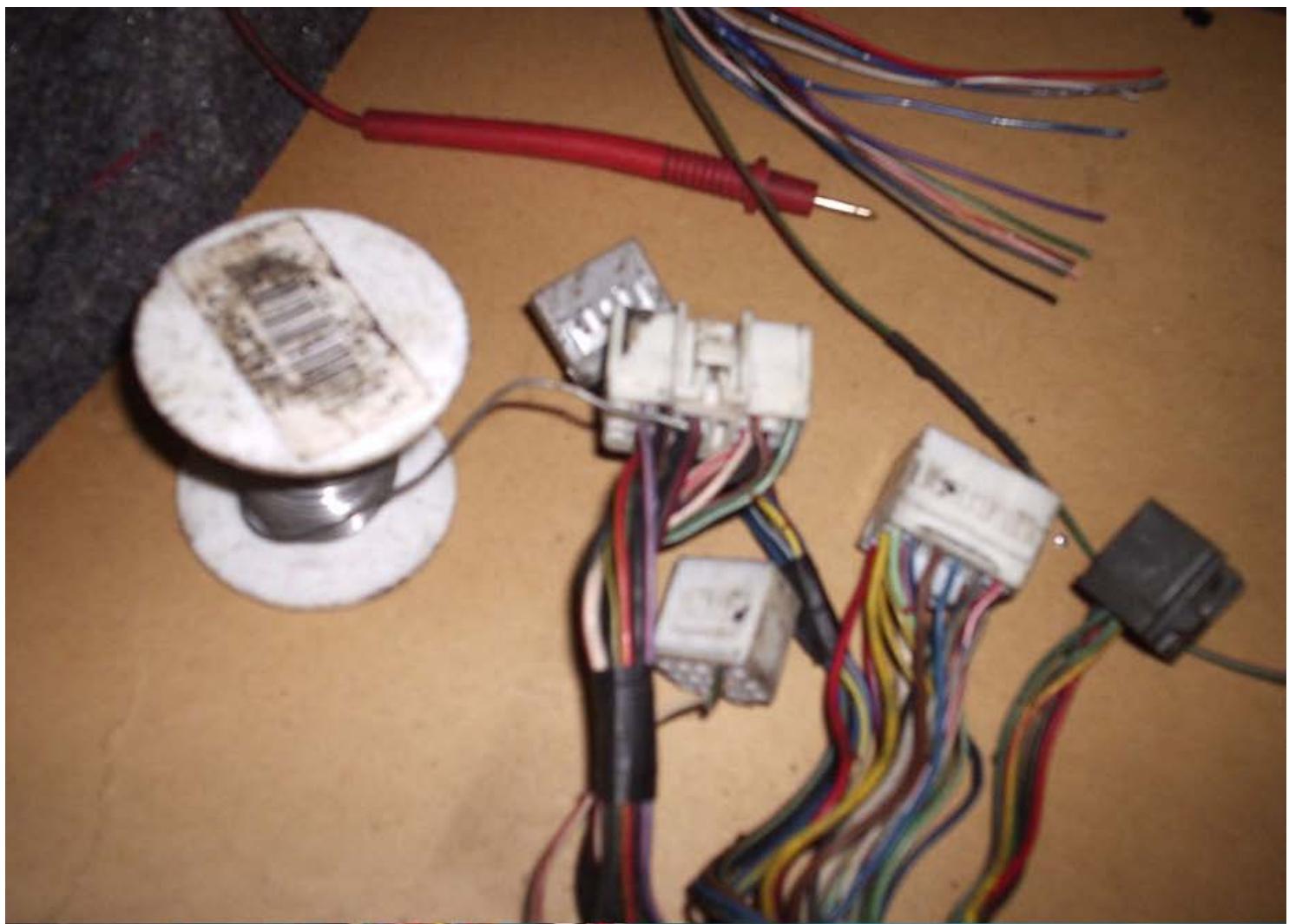
We wont be connecting a lot of these up,maybe 6 or 7 at most.

Wiring up the starter circuit:

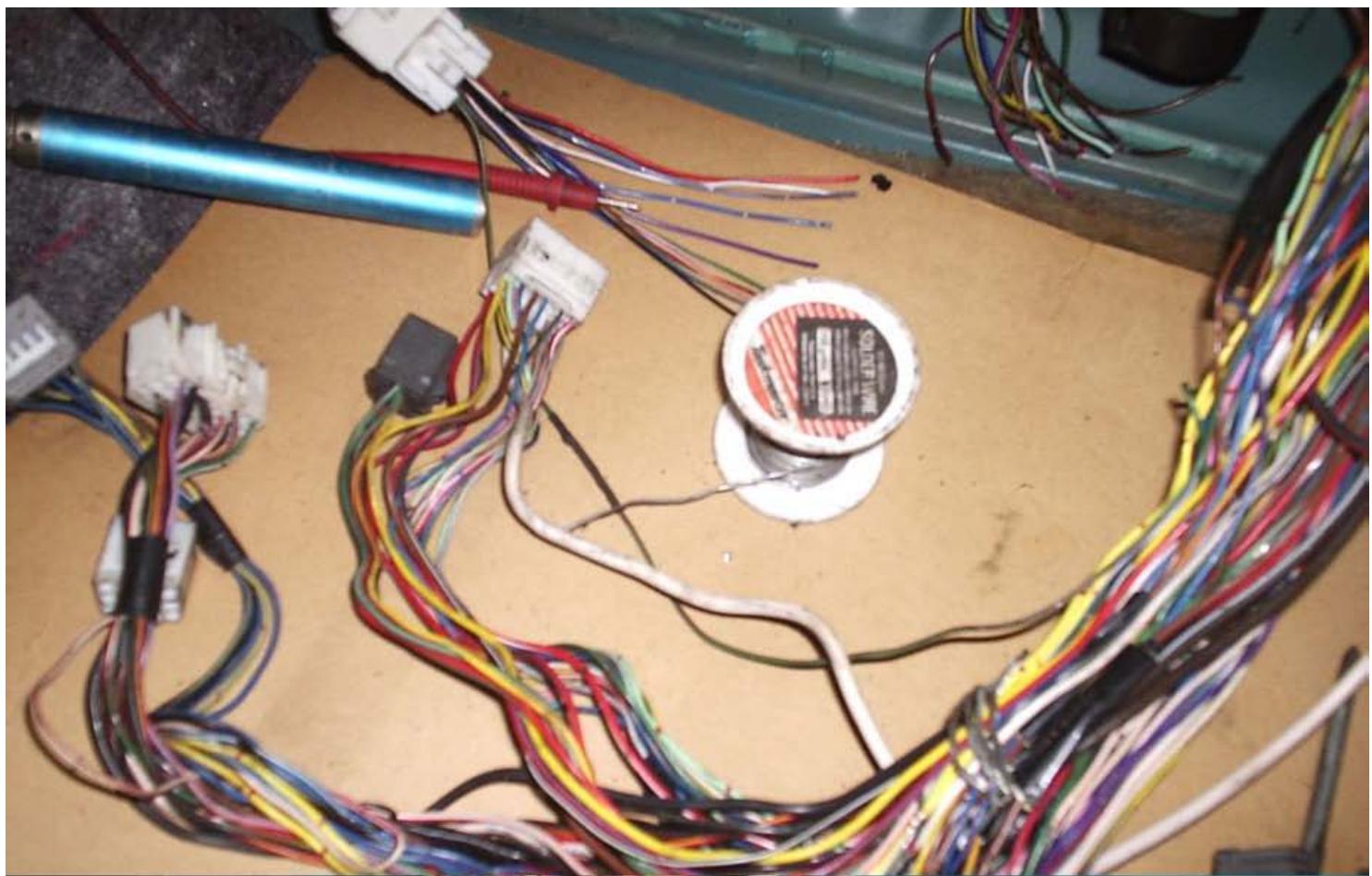
We use the mk2 starter relay, this is located in the boot of the mk2 and is a green relay with four wires on it, its also marked "starter relay" duh! Idiots guide you see! :0) The four wires on this relay are... 1/ Thick white.....this is the main power feed into the relay 2/ Thick black/white....this is the power output that runs to the starter motor solenoid 3/ A white/black wire, this is earth for the relay to work 4/ A red wire, this is the energiser wire that switches the relay on, this signal comes straight from the ignition switch.



Starting with the black/white wire, this goes to the starter motor energiser wire which can be found on this white plug....my solder is pointing to it,a thick black/red wire...so connect the black/white on the starter relay to this black/red wire.



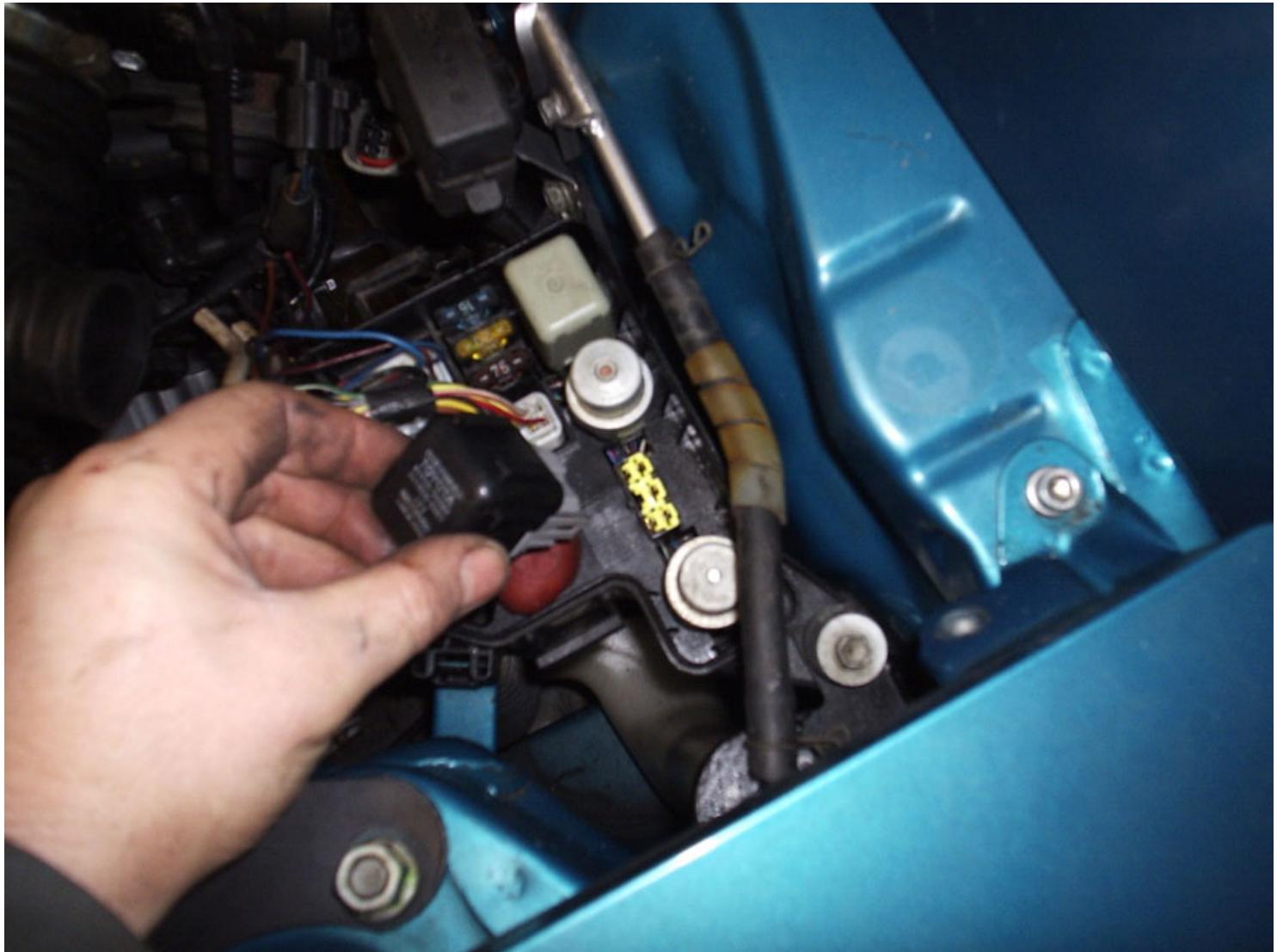
Next is the thick white on the starter relay, this connects straight to the thick white in the v6 harness here....



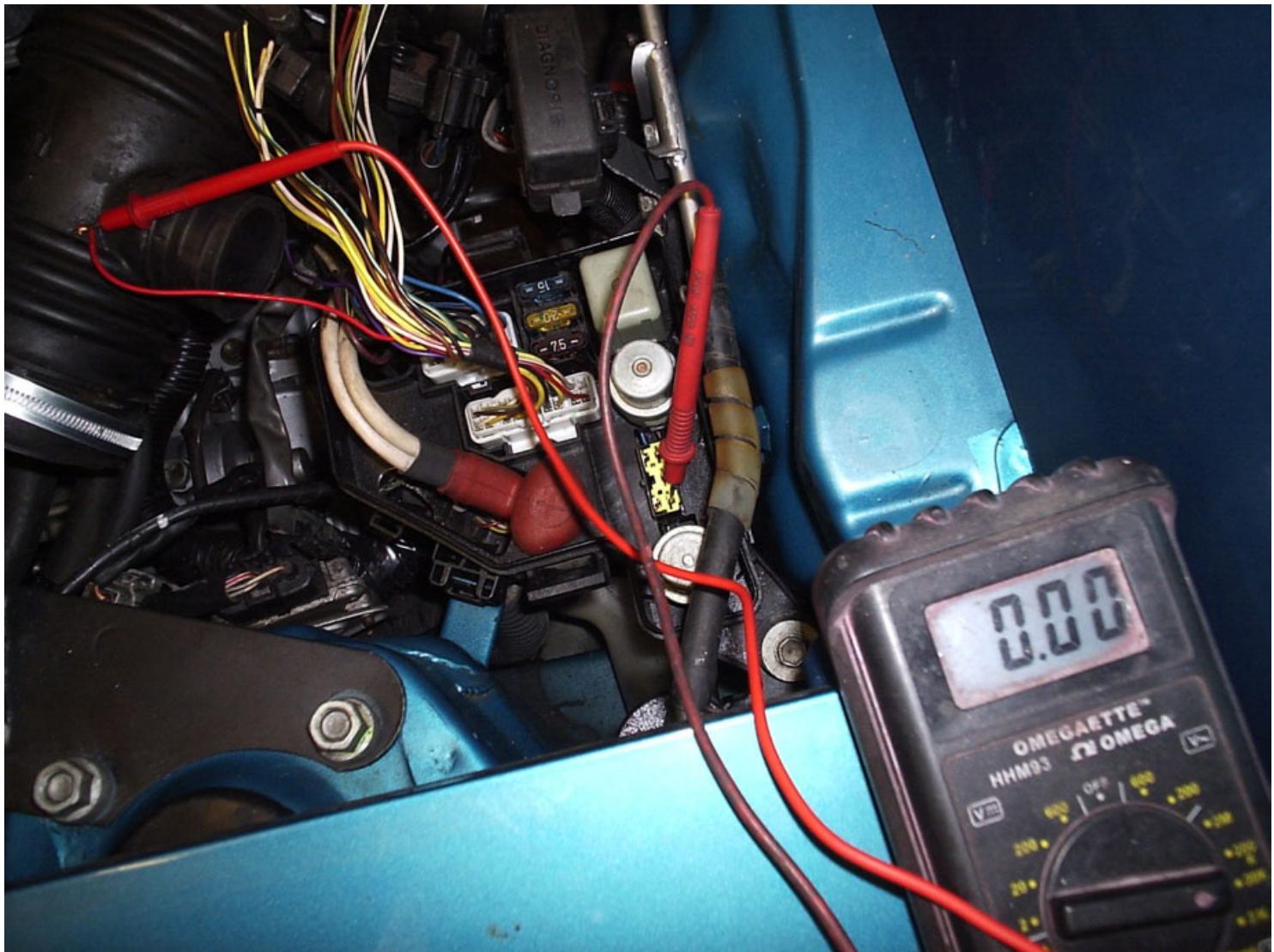
Next wire on the relay is the white/black earth wire,simply put a ring terminal on it and attach it to the bolt shown...



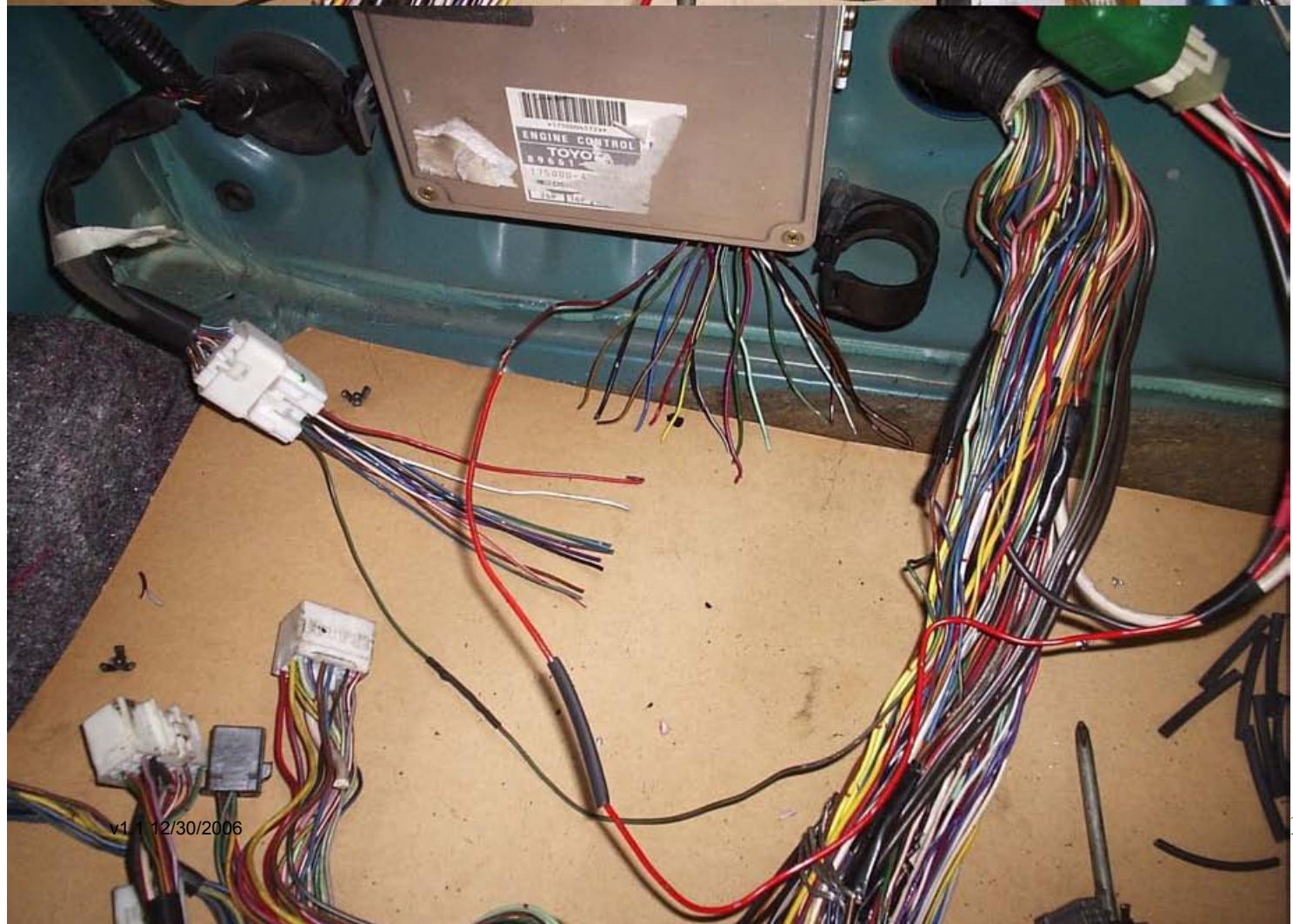
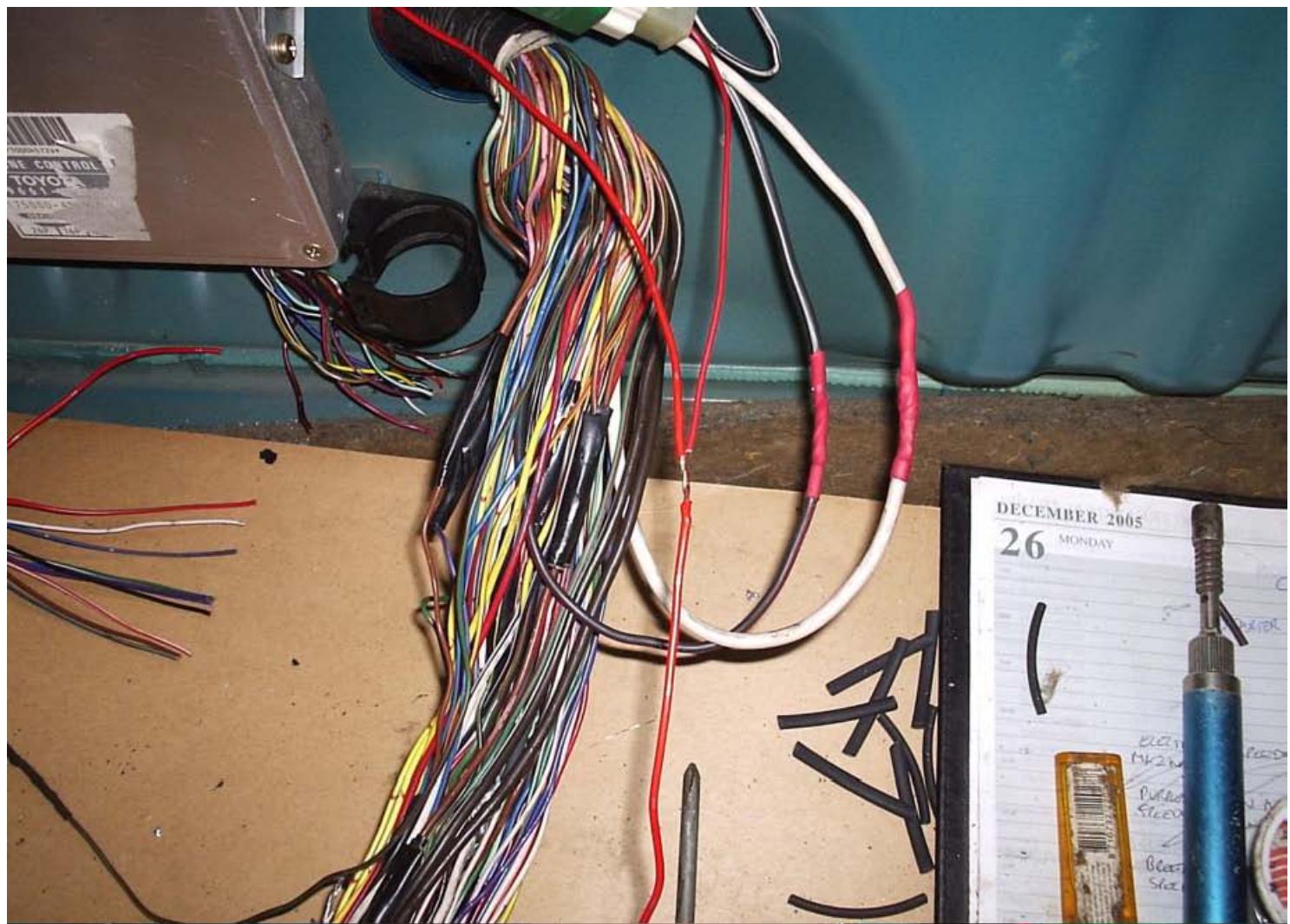
The last wire on the relay is the red one, this needs to go to two places, one of those is the starter pin of the COR (circuit opening relay) located in the mk2 engine bay fusebox. The way to locate which terminal it is ,is by removing the COR as pictured below...



that will reveal 5 pins, now i know these pins inside out but as per the disclaimer in this write up id prefer everyone to test the pins themselves with a multimeter. The wire that usually connects to the STA pin of the COR is RED, or sometimes RED with SILVER dots. So locate a red wire either in the mk2 fusebox (3s-fe) or in the boot (3s-ge,gte) and run a continuity test to all pins of the COR. If one pin has continuity to your RED wire then you know thats the STA wire that we need to connect to our RED wire on the starter relay....below you can see my continuity test has confirmed which pin is the STA.



Now extend this RED wire through the firewall and onto the RED wire on the starter relay. Continue the wire on to its second destination which is PIN 11 on the 4th ECU plug which is usually a black/red wire...

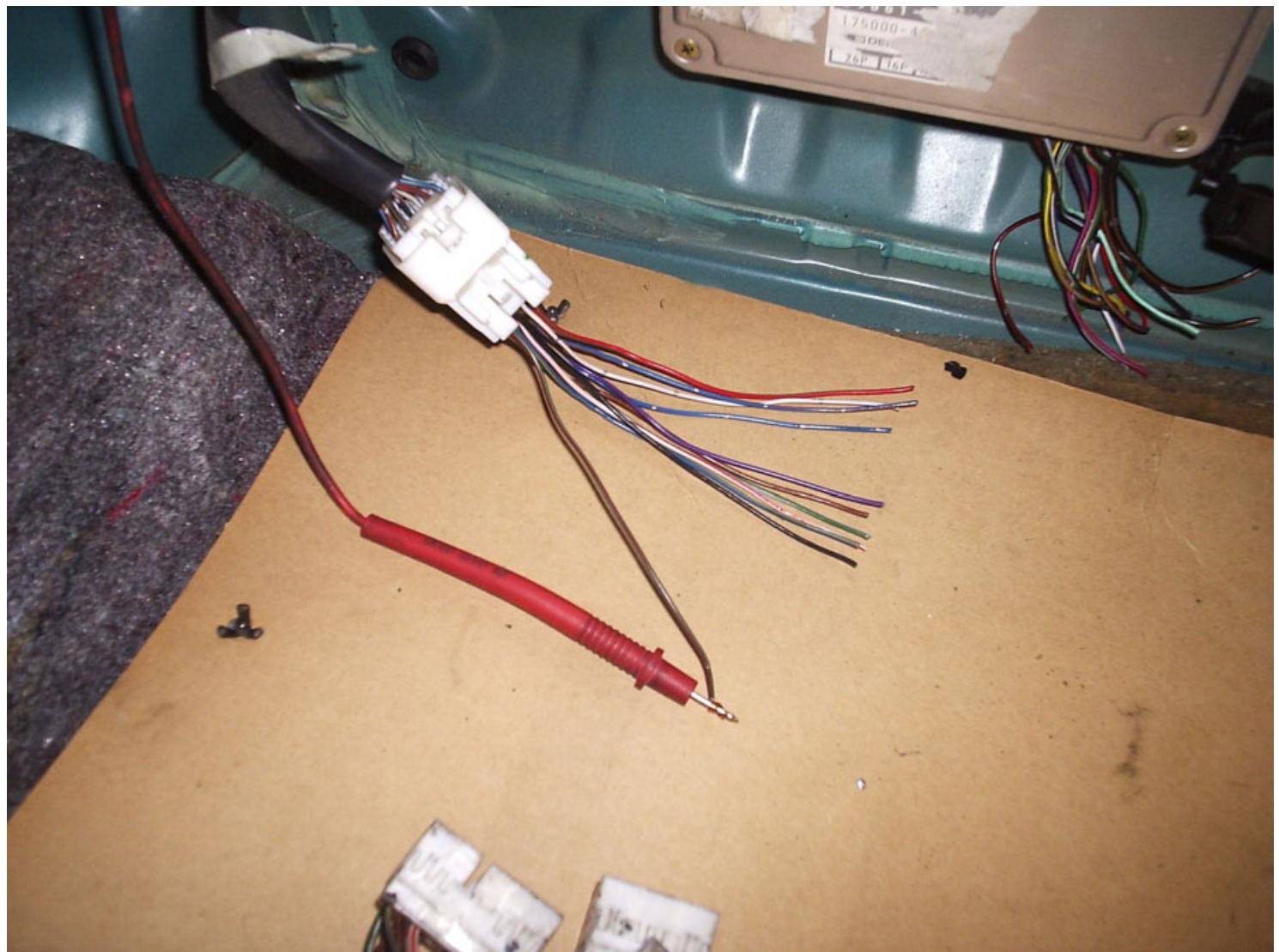


That is the starter relay wiring completed, all four wires joined up.

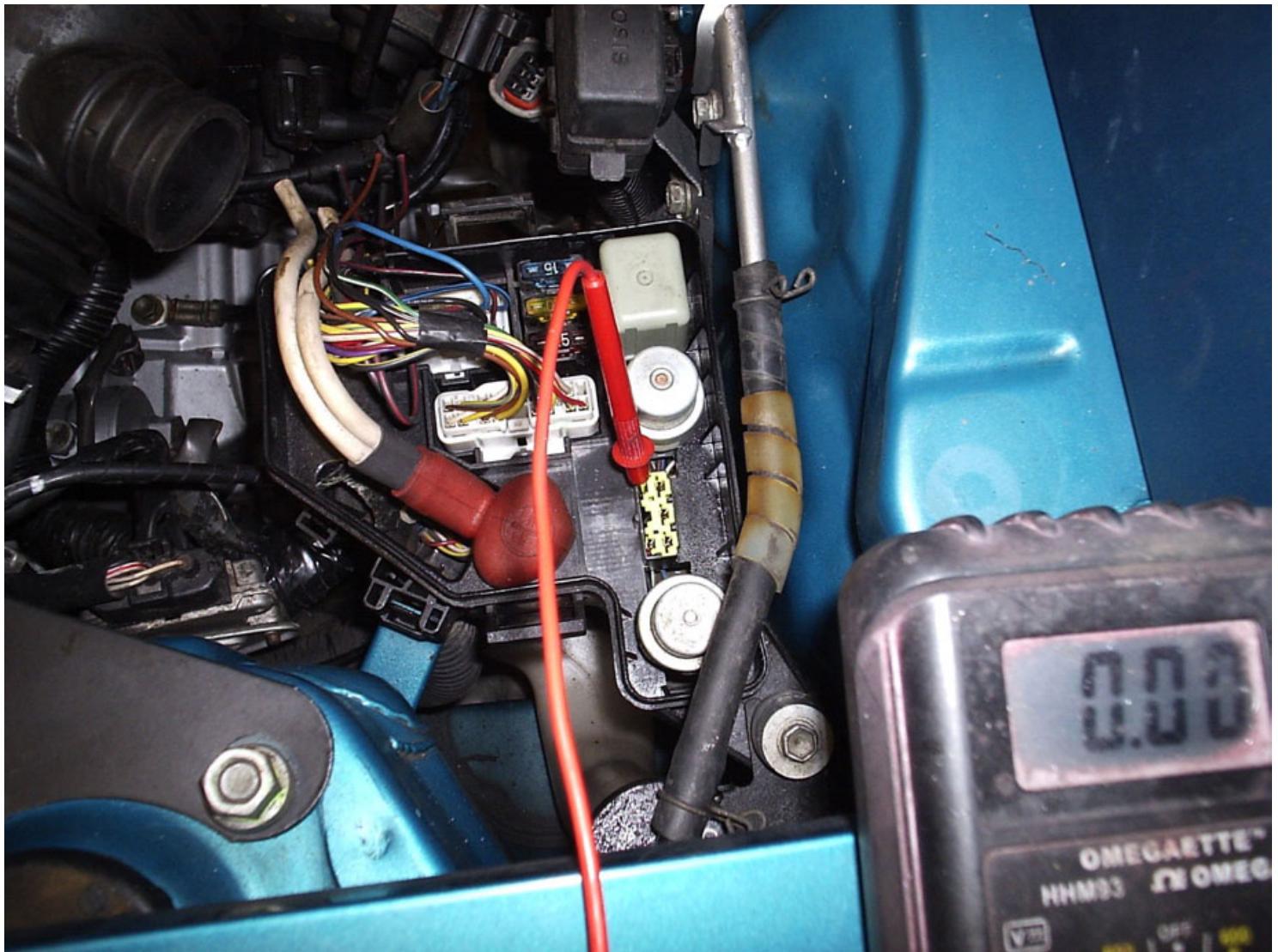
Wiring the COR:

On a mk2 4 out of the 5 pins on the COR are already wired into the fusebox for us, all we need to do is connect 1 wire. This wire is a GREEN/RED wire that when connected holds the COR open after cranking so that the fuel pump continues to run. When the engine stalls this wire lets go of the COR and the fuel supply stops.... prevents you burning to death, which is nice.

To locate the Green/red holding wire again run a continuity test to whichever green/red wire on the mk2 harness you suspect, again the location differs according to mr2 revision and engine type... on a 3s-fe engined car its here...

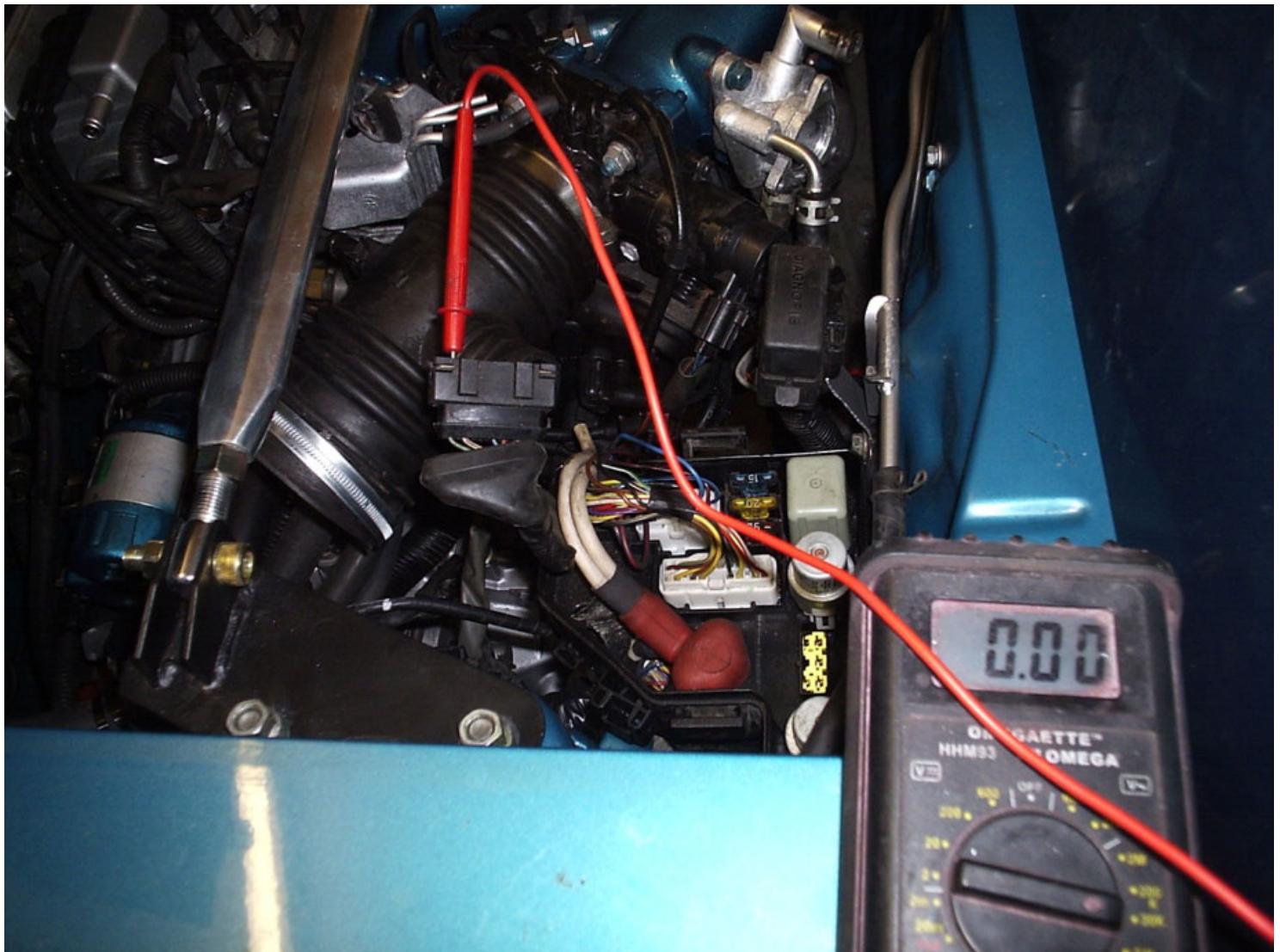


And the pin on the COR that this is connected to confirming its the holding wire is here.....

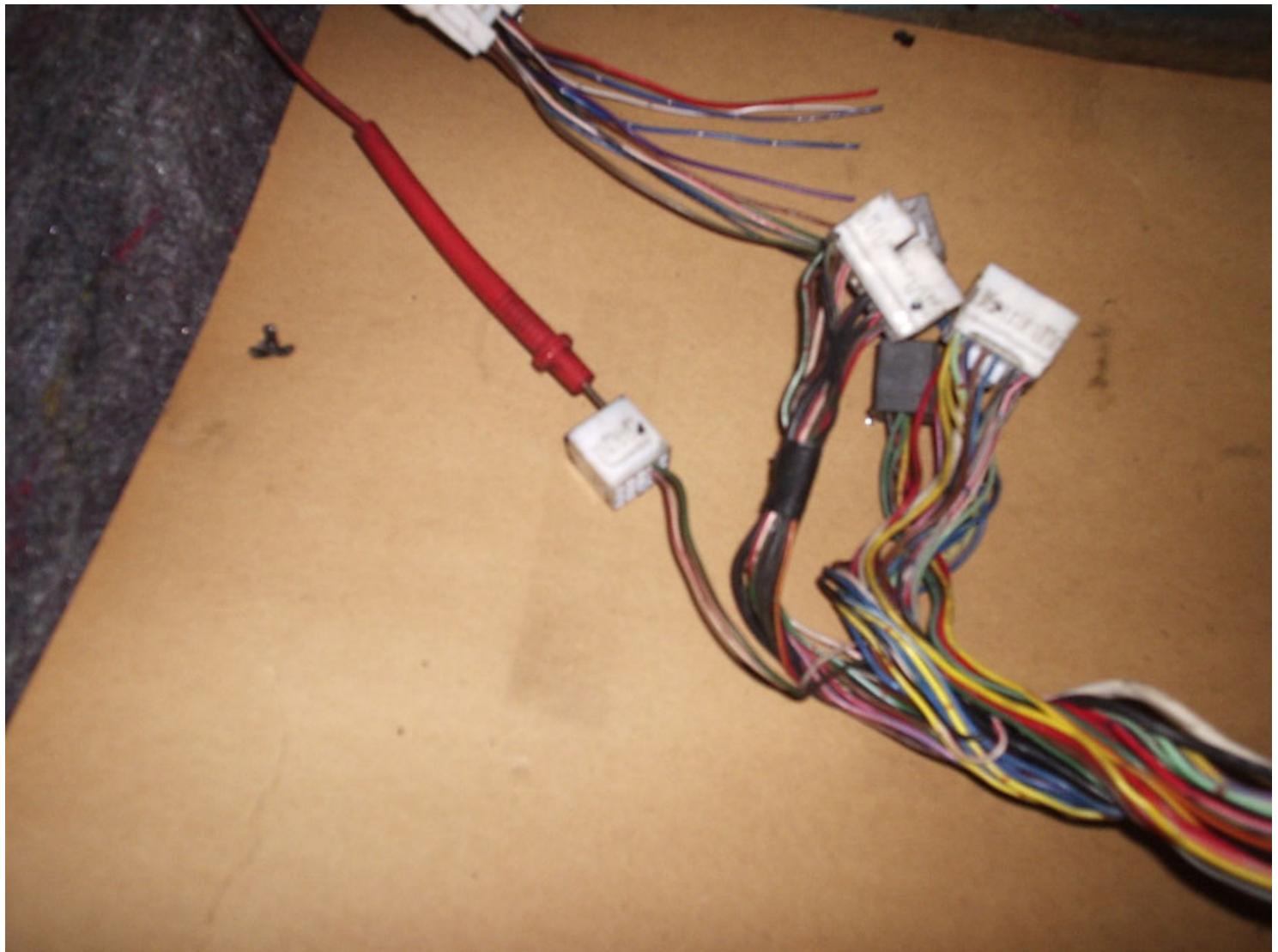


but again,please test this for yourself.

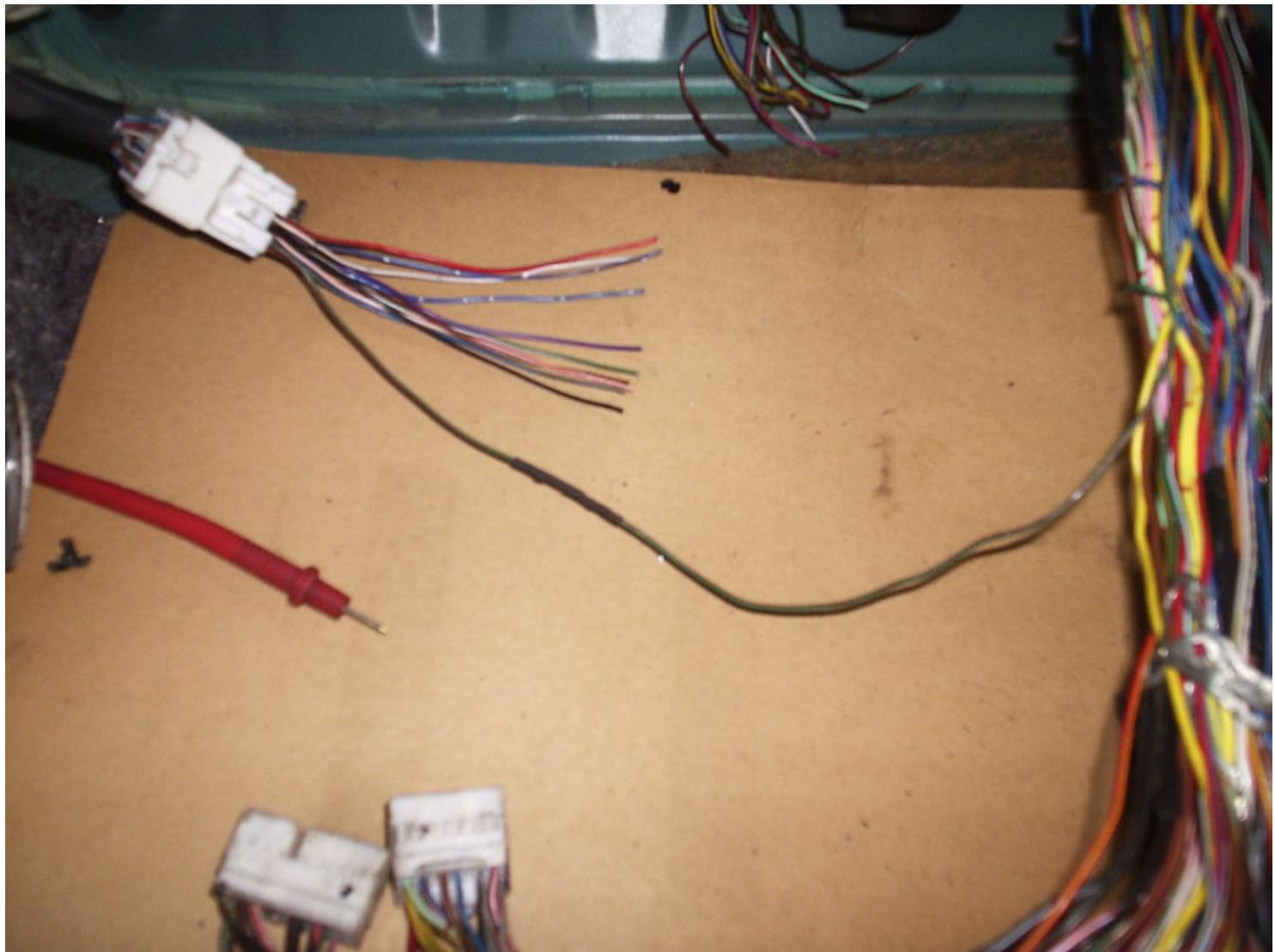
This green/red wire must connect to the green/red wire that's on the last pin of the AFM connector....again a continuity test confirmed where this green/red exits the v6 engine harness in the boot...



One probe in the AFM green/red....and the other probe on whichever green/red in the boot you suspect as being attached to this....



On this v6 harness it was here ^ ^ ^ ^ so all we need to do is attach this wire to the green/red we found on the white plug on the mr2 body harness....

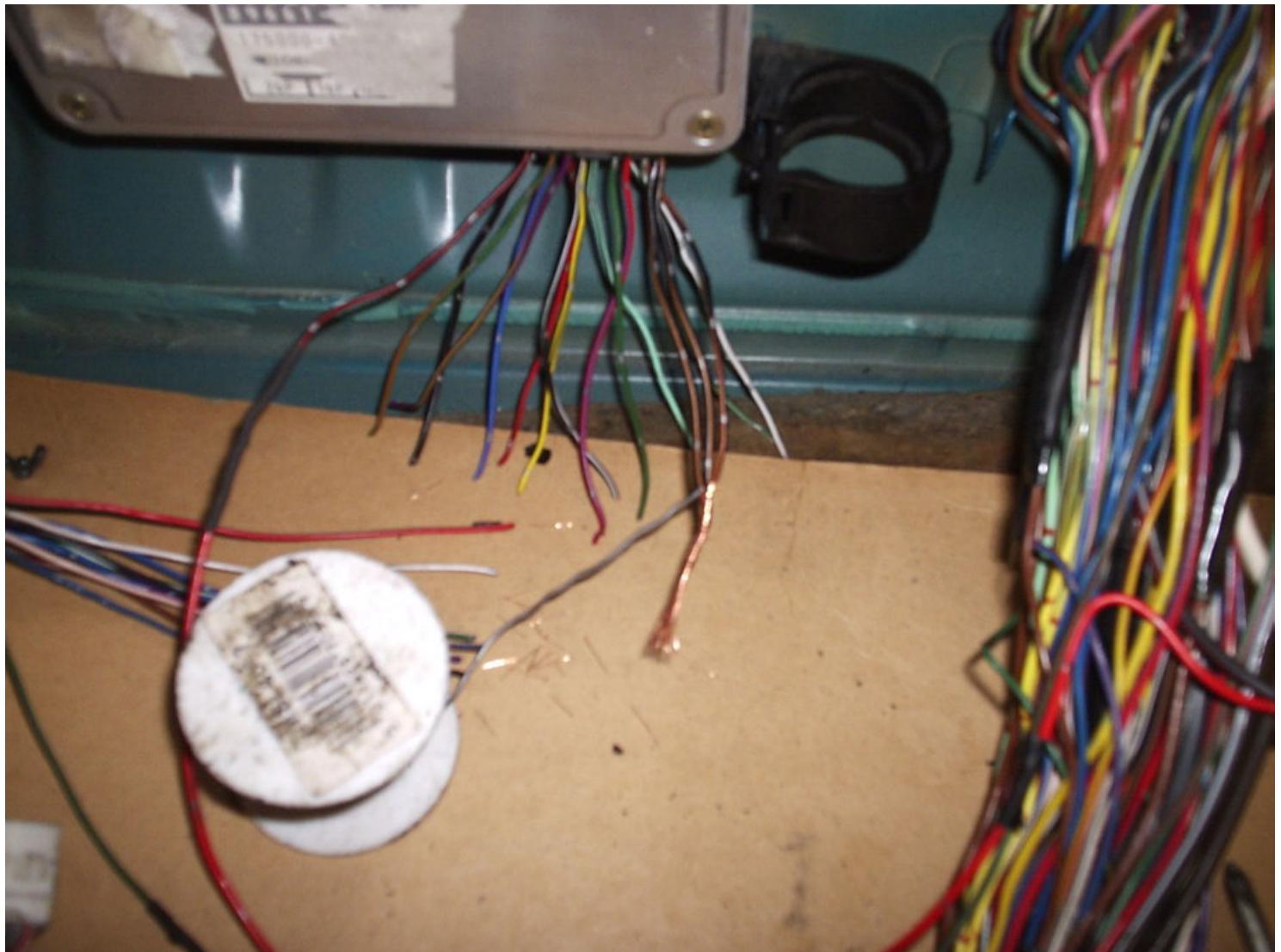


Thats the COR wiring completed,just one wire but you must get it right or the engine will only run for 2 seconds and die.

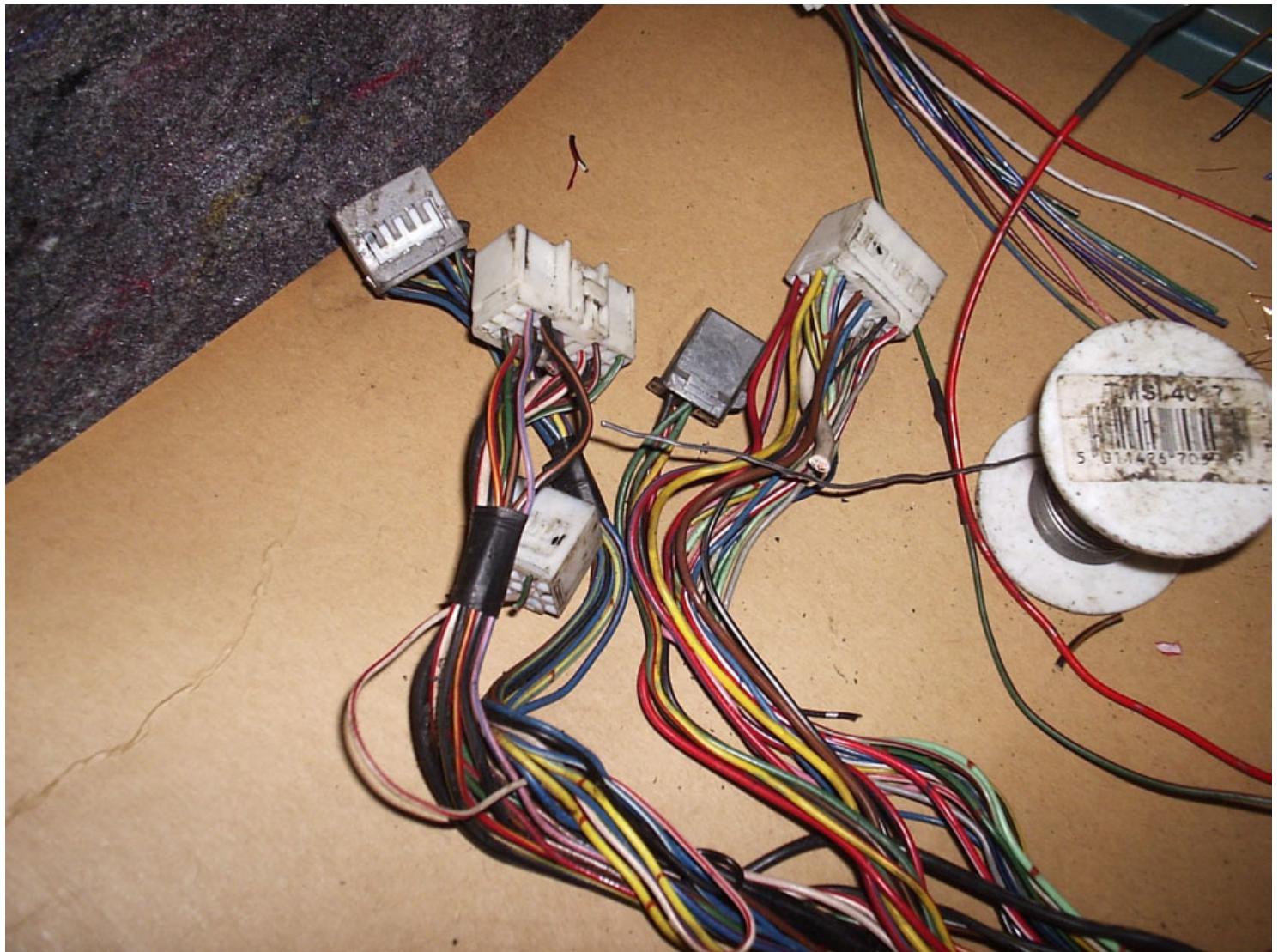
Wiring the V6 4th ECU plug:-

Theres 7 wires to connect to this plug,but we have already done one of them when tackling the starter relay red wire to PIN 11 of the ECU plug,so just 6 to do.

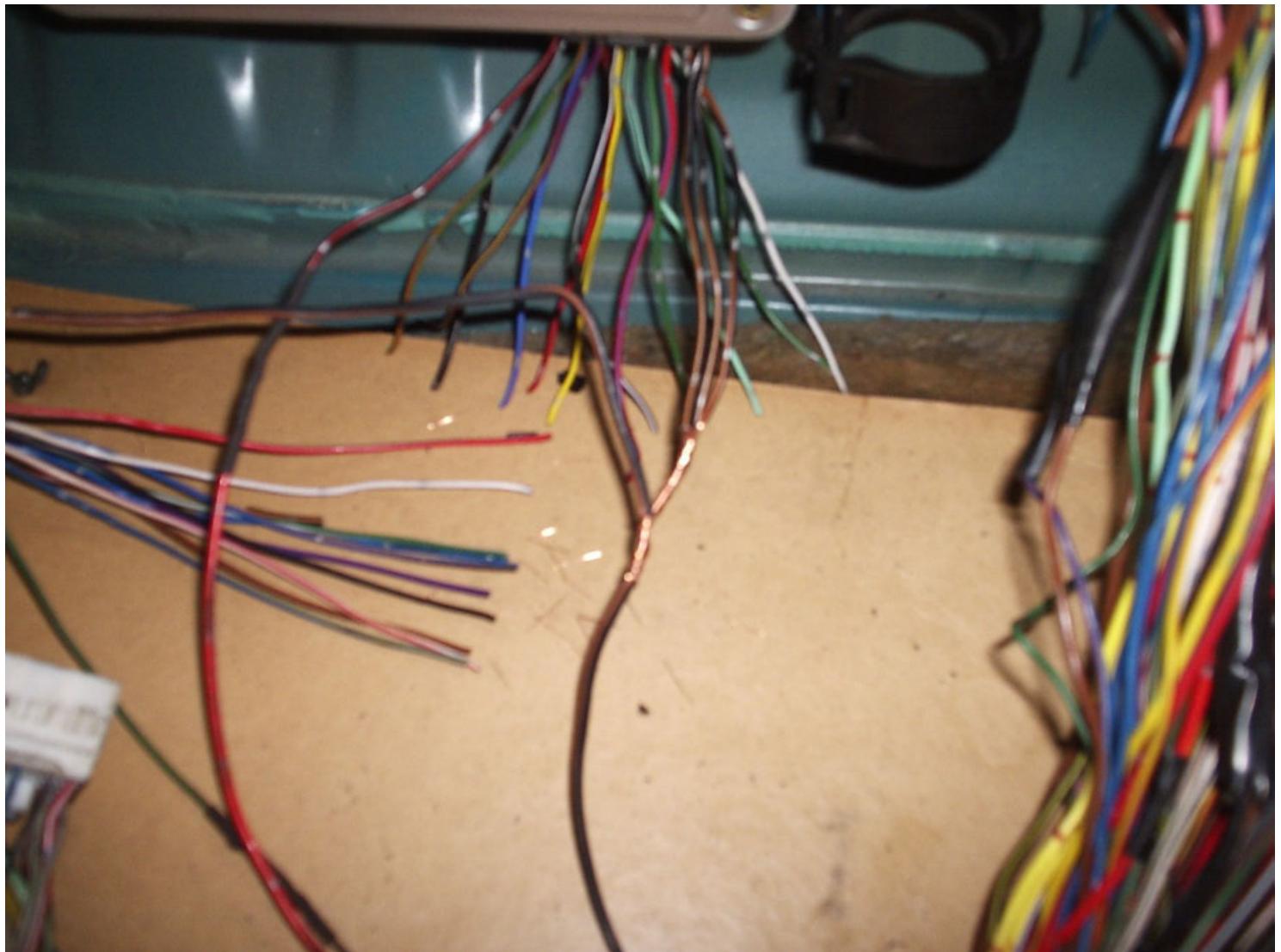
Locate the three black/orange wires on the ECU plug,these are at terminals 1,12 and 13....its not hard,theres no other black/orange wires on that plug.Join all three of them together....



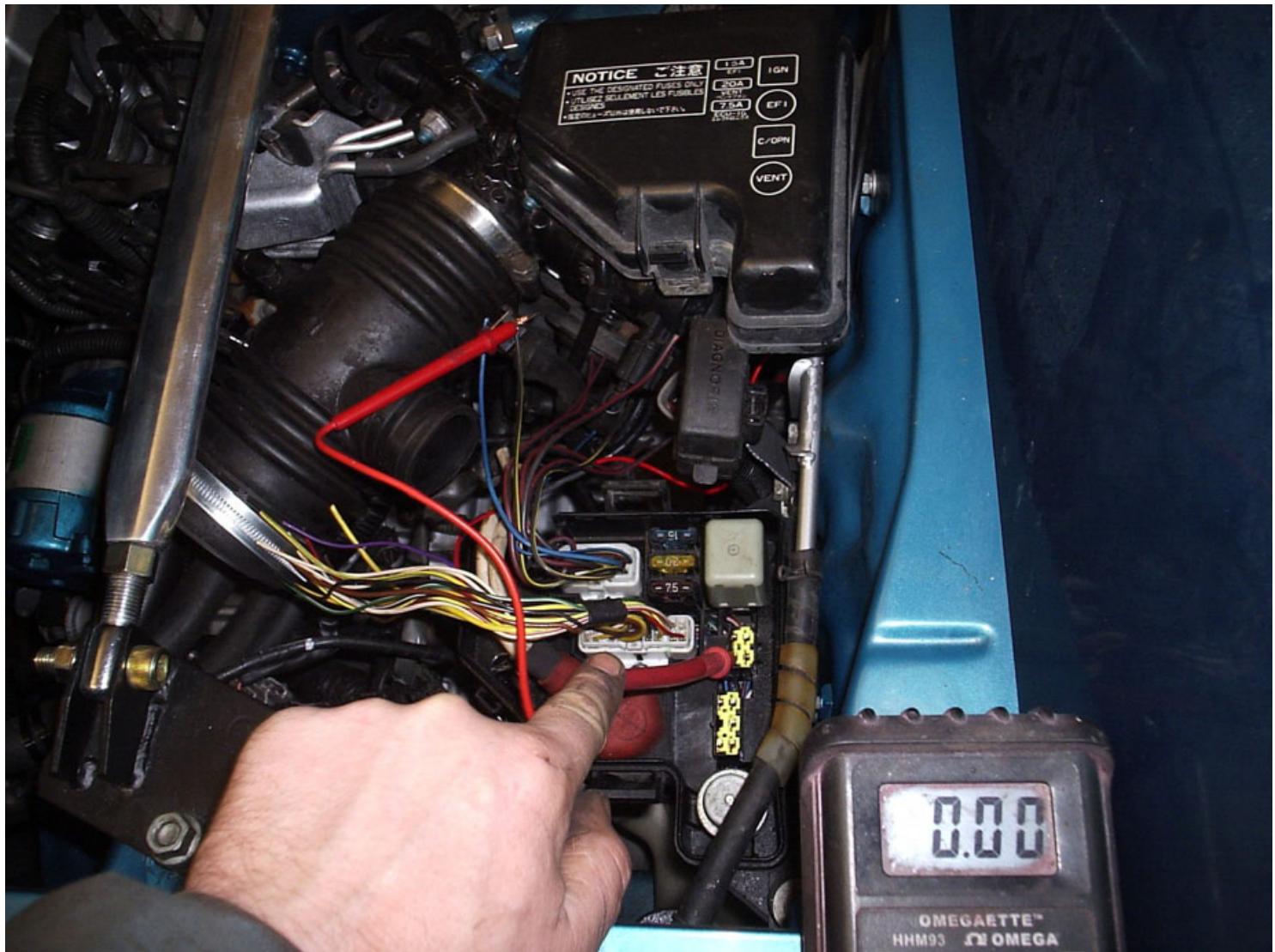
Now you also need to locate a thick black/orange wire on the V6 engine harness which is at this white plug...



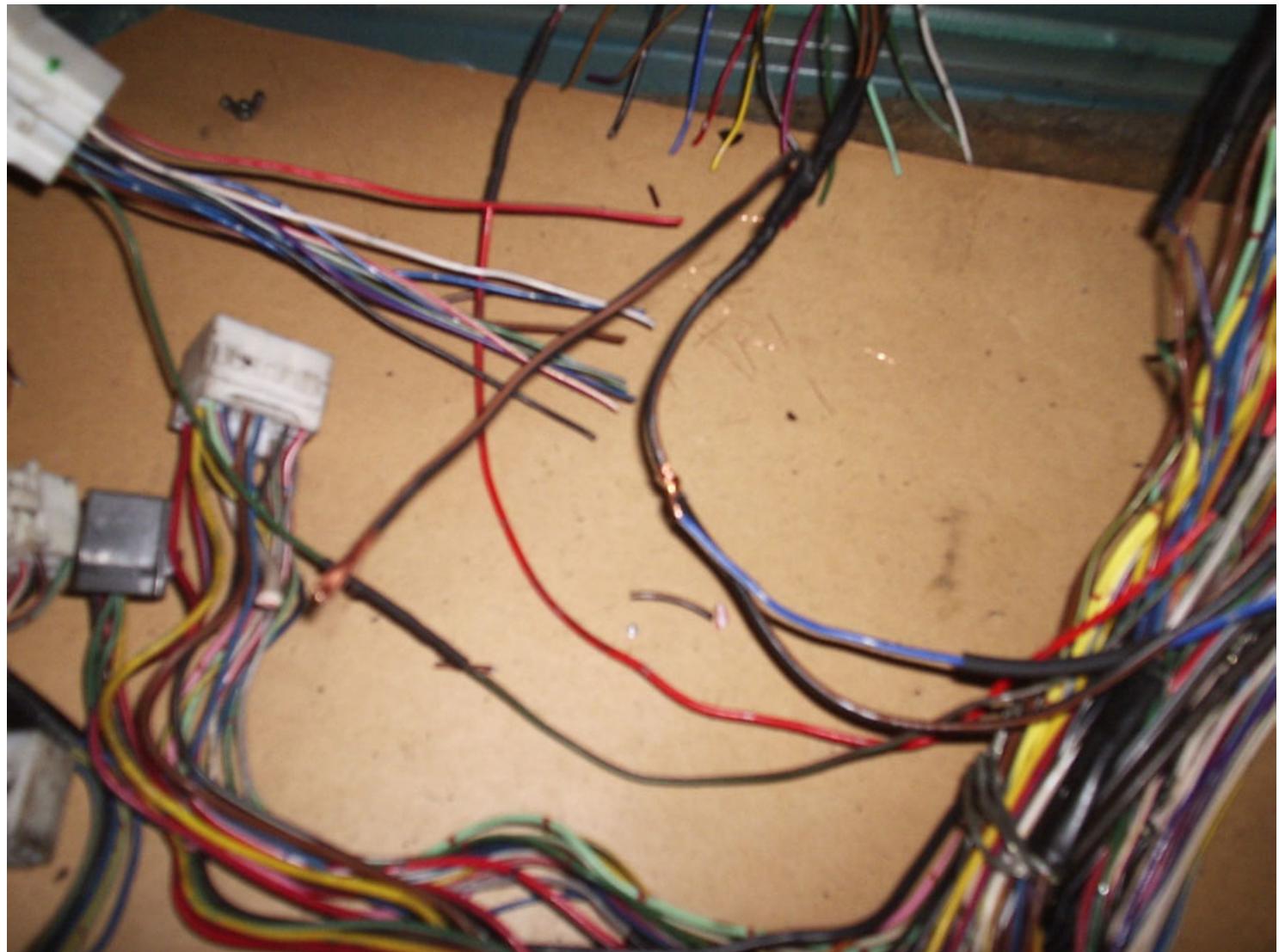
Cut this wire and join it onto the 3 black/orange ECU plug black/orange wires. The picture below shows them all connected together and a tail shooting off to the left, this will be connected to the engine bay fan eventually, planning ahead and all that!



Now we need to locate the EFI relay output terminal wire to join up to all four of these black/orange wires. Start by removing the EFI relay....

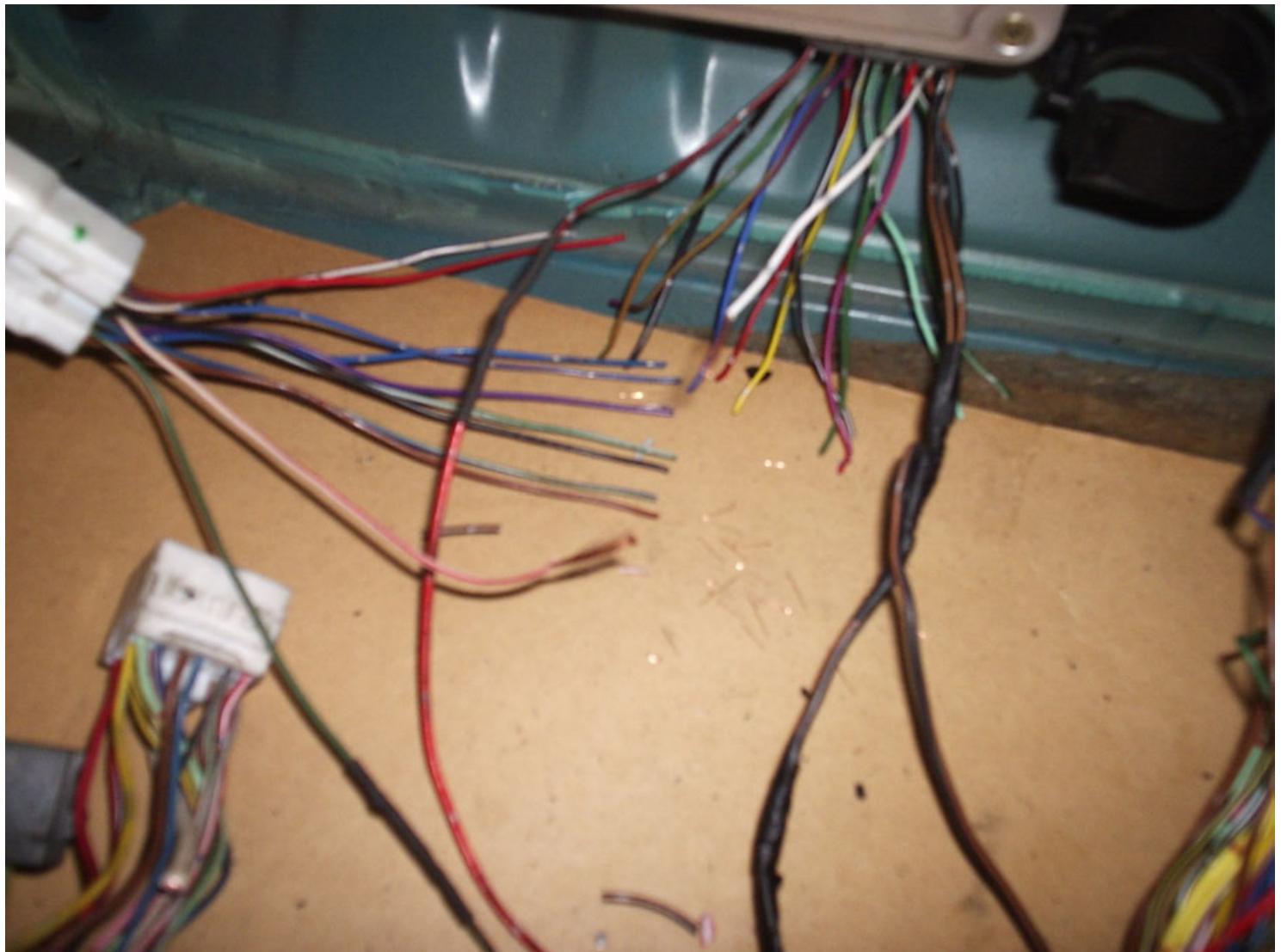


....and locate a Black/yellow wire either in the mk2 fusebox or in the boot,again depending on revision and engine....on the 3s-fe its in the fusebox,above you can see the continuity test confirmed the black/yellow wire is connected to pin 4 of the EFI relay.We need to extend this Black/yellow wire into the boot and onto all 4 black/orange wires as previously mentioned.

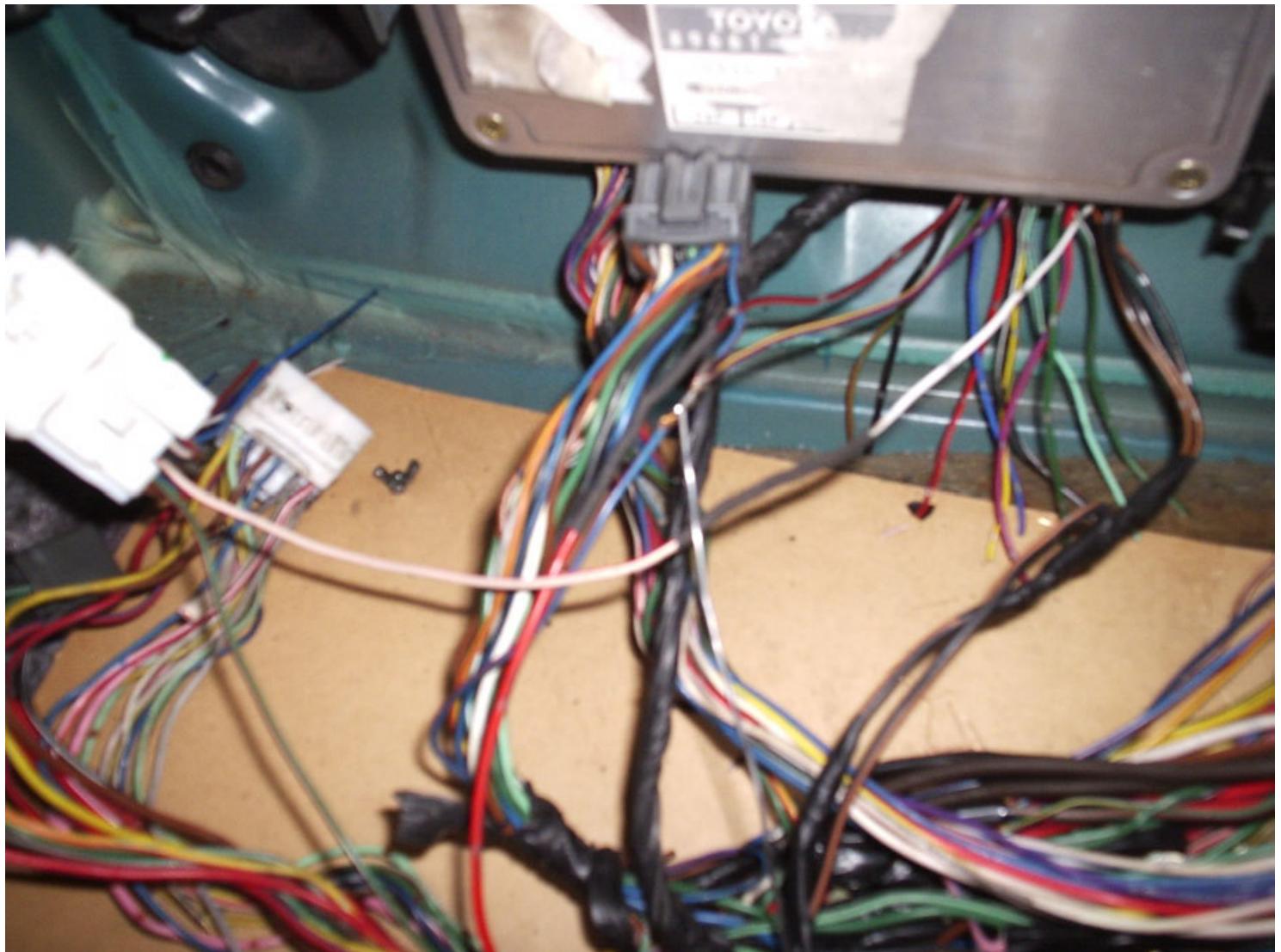


I didnt have a suitable black/yellow wire that was thick enough to extend with so i used a nice thick blue one as shown above, but you really should try to keep the colours the same or at least relevant. So thats 3 of the 6 4th ECU plug wires done.

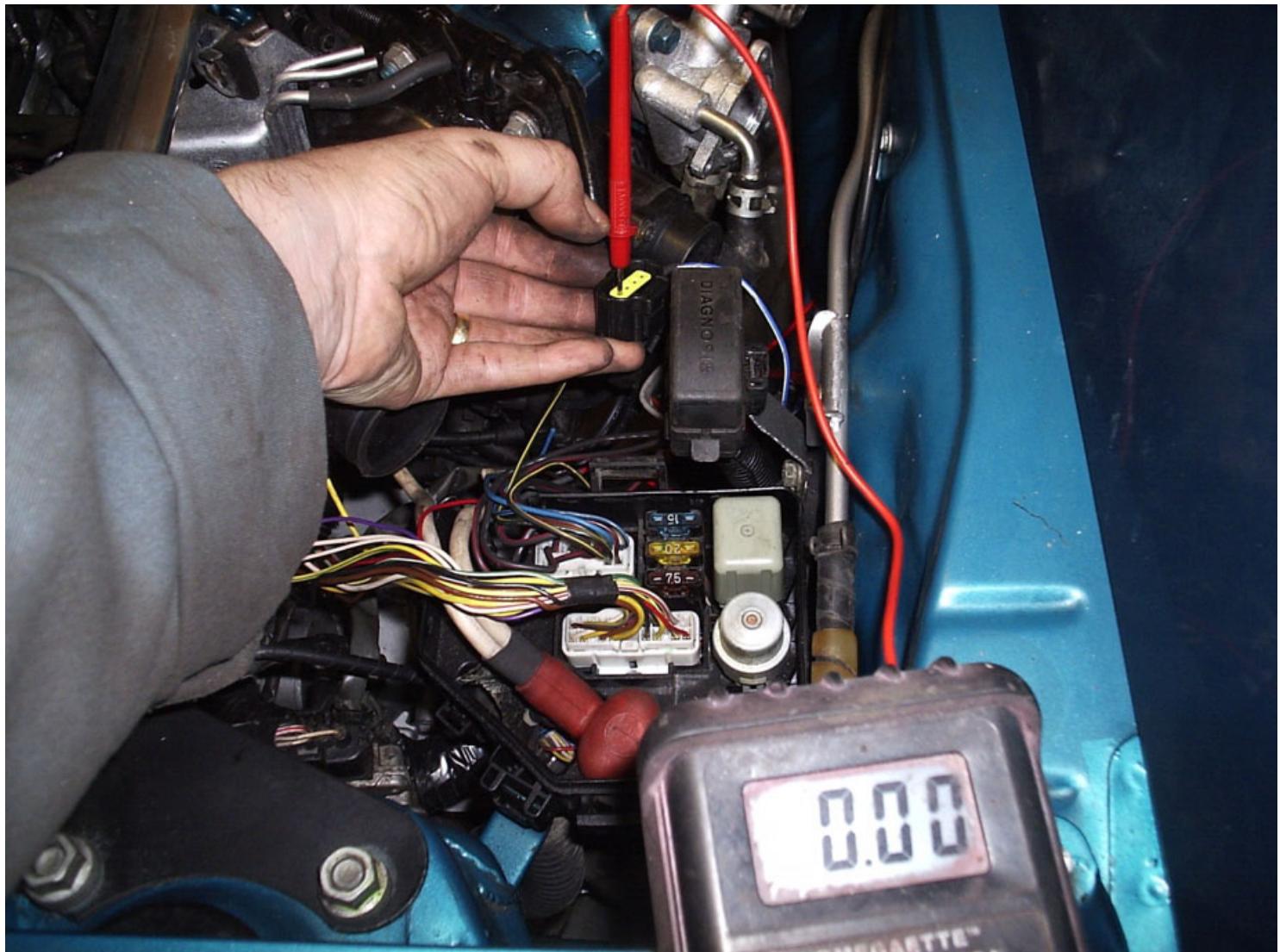
Next wire is the white/green on pin 2 of the ECU plug, this is for permanent battery memory of the ECU...here you can see it in the top middle of the shot next to the black/orange wires...



This wire gets connected to a white/red wire which is battery permanent or to the thick white wires anywhere on the v6 harness.... but ive connected it to the white/red wire here...on the boot plug.

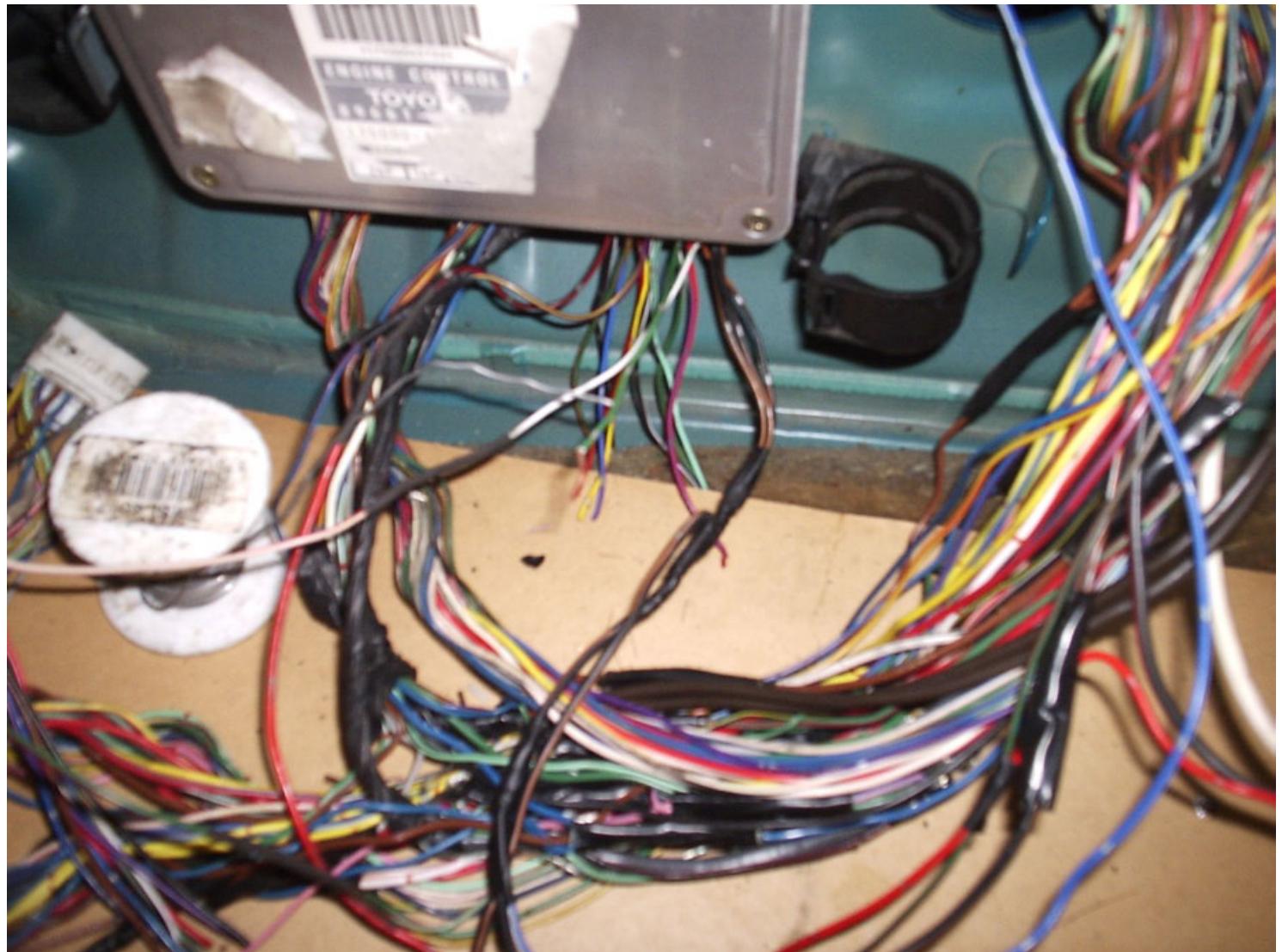


Also above you can see the next wire that needs connecting, my solder is pointing to it, its the purple/yellow wire SP1, we need to supply this wire with a constant 5v feed... it usually picks up a speed signal but the v6 speed signal sensors are incompatible with mr2 ones and send out different readings, so giving it a 5v supply prevents a horrible hiccup that used to occur when accelerating hard through the gears. Its "T"'d into the blue/red wire that runs from pin1 of the 16 pin plug on the ECU to the TPS sensor in the engine bay. If unsure run a quick continuity test from the blue/red at the TPS to whichever blue/red wire you suspect at the ECU....



above, pin 1 of the 16 pin ecu plug is confirmed as the same blue/red wire on the TPS plug, we T the purple/yellow wire on the 4th ECU plug into this wire.

Next wire is the Green check engine light for the dash, this is located on pin 5 of the 4th ECU plug....solder pointing to it below....



This goes to the green/white wire that's located in the mk2 fusebox (3s-fe) or in the boot (3s-ge,gte), again run a continuity test between the green/white wire on the dash clocks check engine light and whichever G/W wire you suspect....here it is on the 3s-fe...

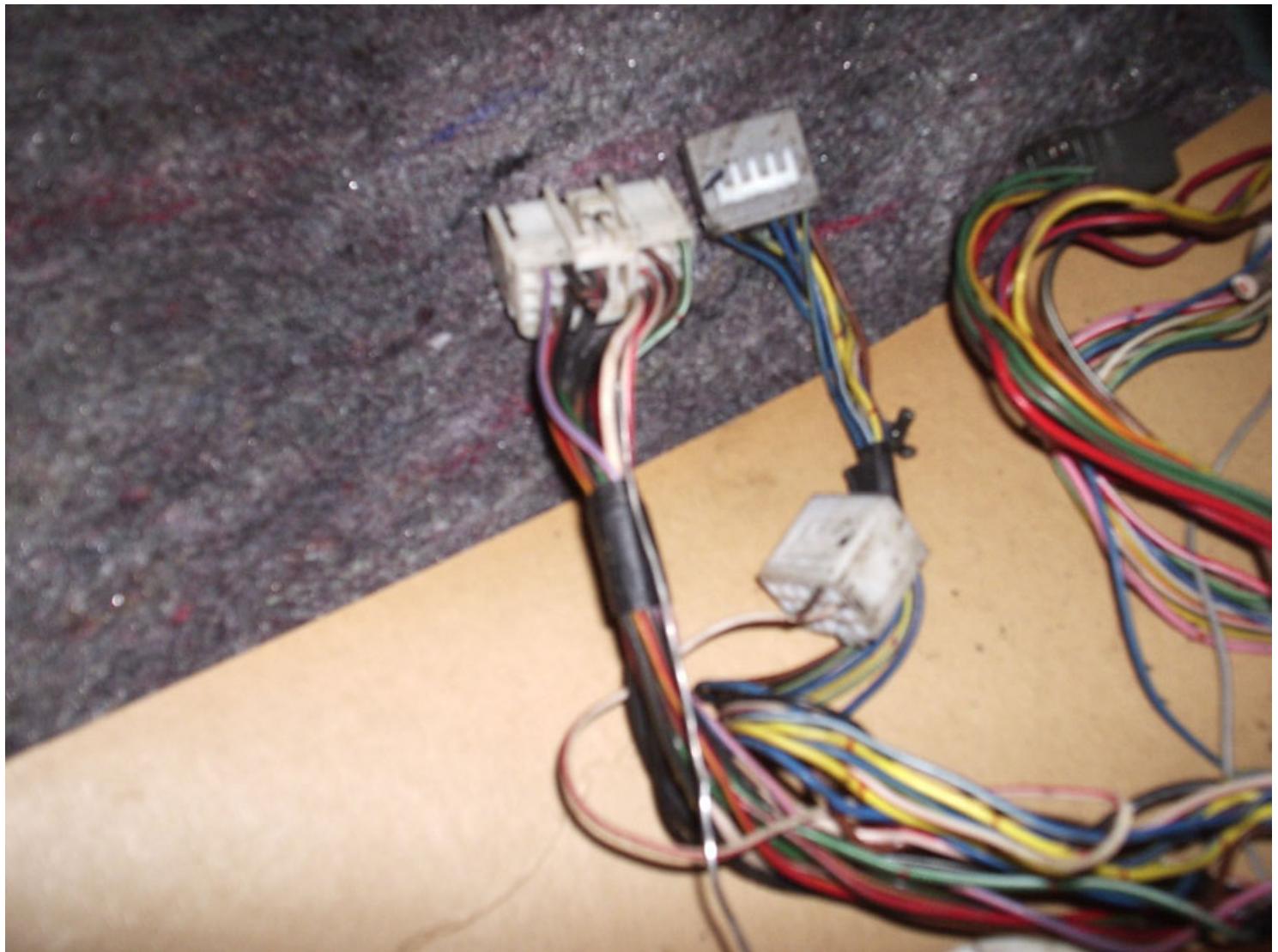


Again, extend this wire into the boot and connect onto pin 5 Green wire on the 4th ECU plug.

Thats all 7 wires on the 4th ECU plug done...the rest can be taped up.

Wiring the ignition and injectors:

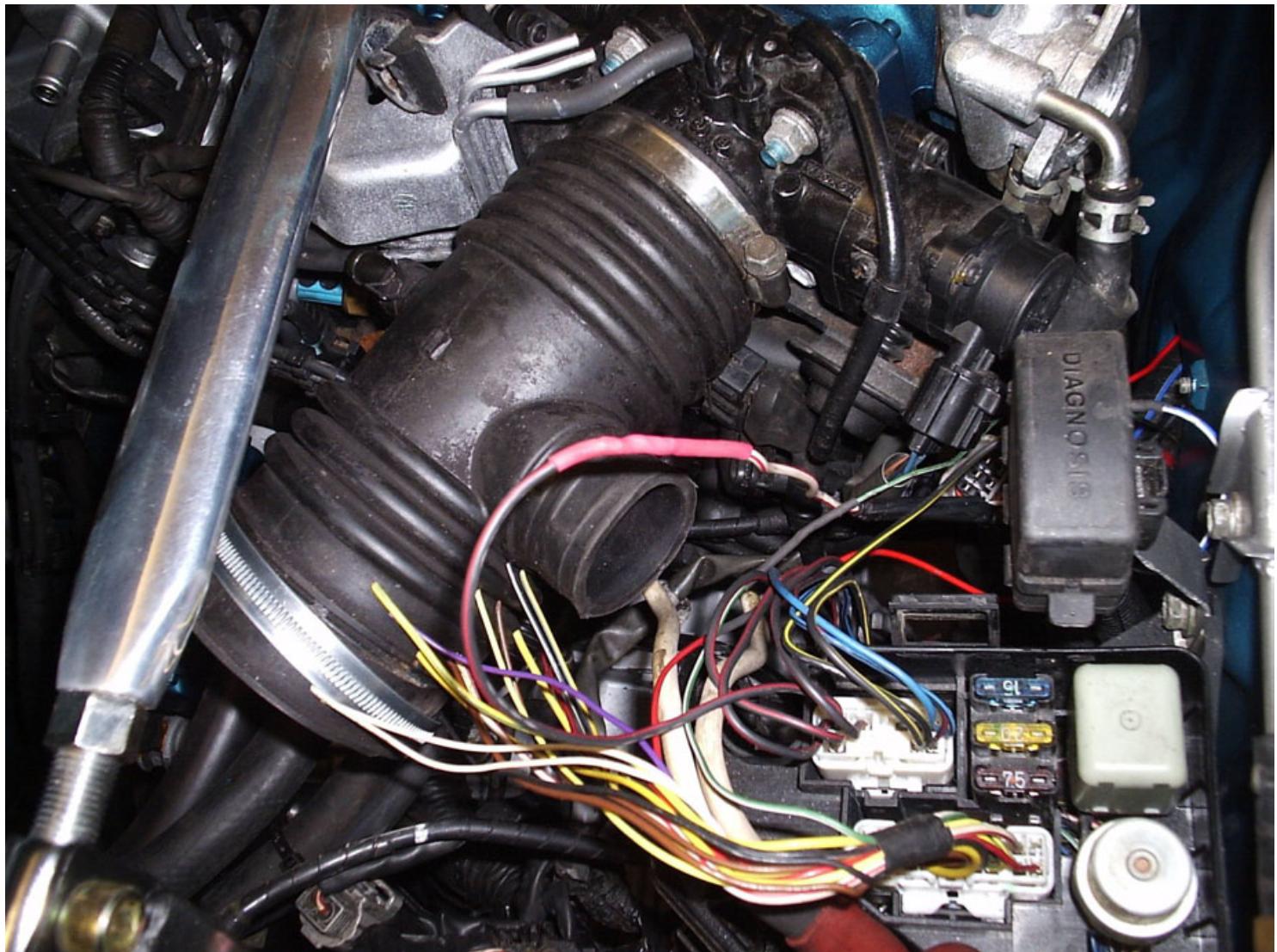
There are two white/red wires on the white v6 plugs in the boot that are for the ignition amplifier/coil feed and also the injector power ups....they are here...solder pointing to them, cut them and feed them through the boot towards the fusebox.



They need to be joined to the black/red engine main relay output wires, these are easy to spot, 4 thick black/red wires coming out of the mk2 fusebox, use any or all of them.

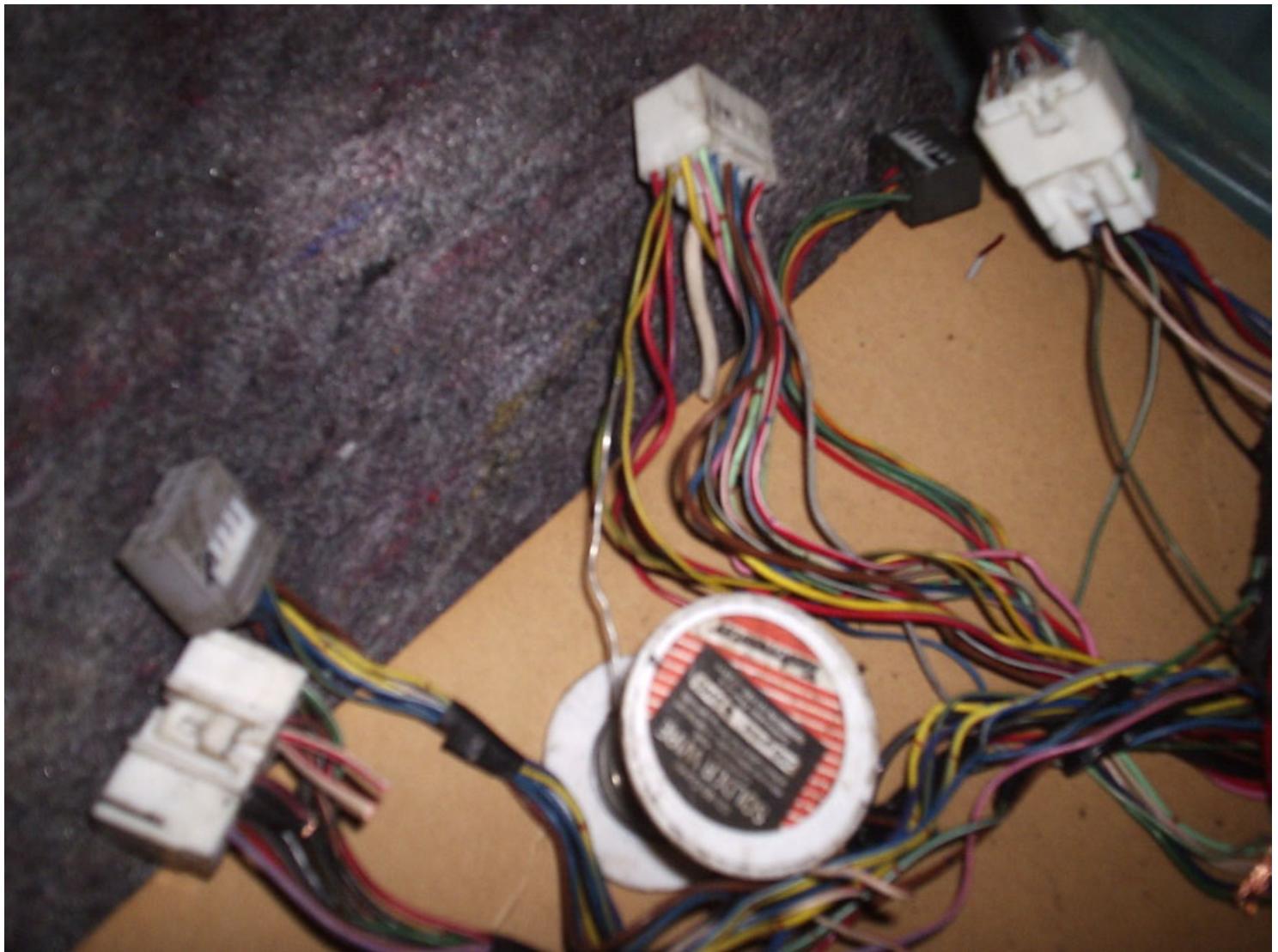


The unused ones you can tape up....join one or all of these wires onto the white/red wires you brought through from the boot.

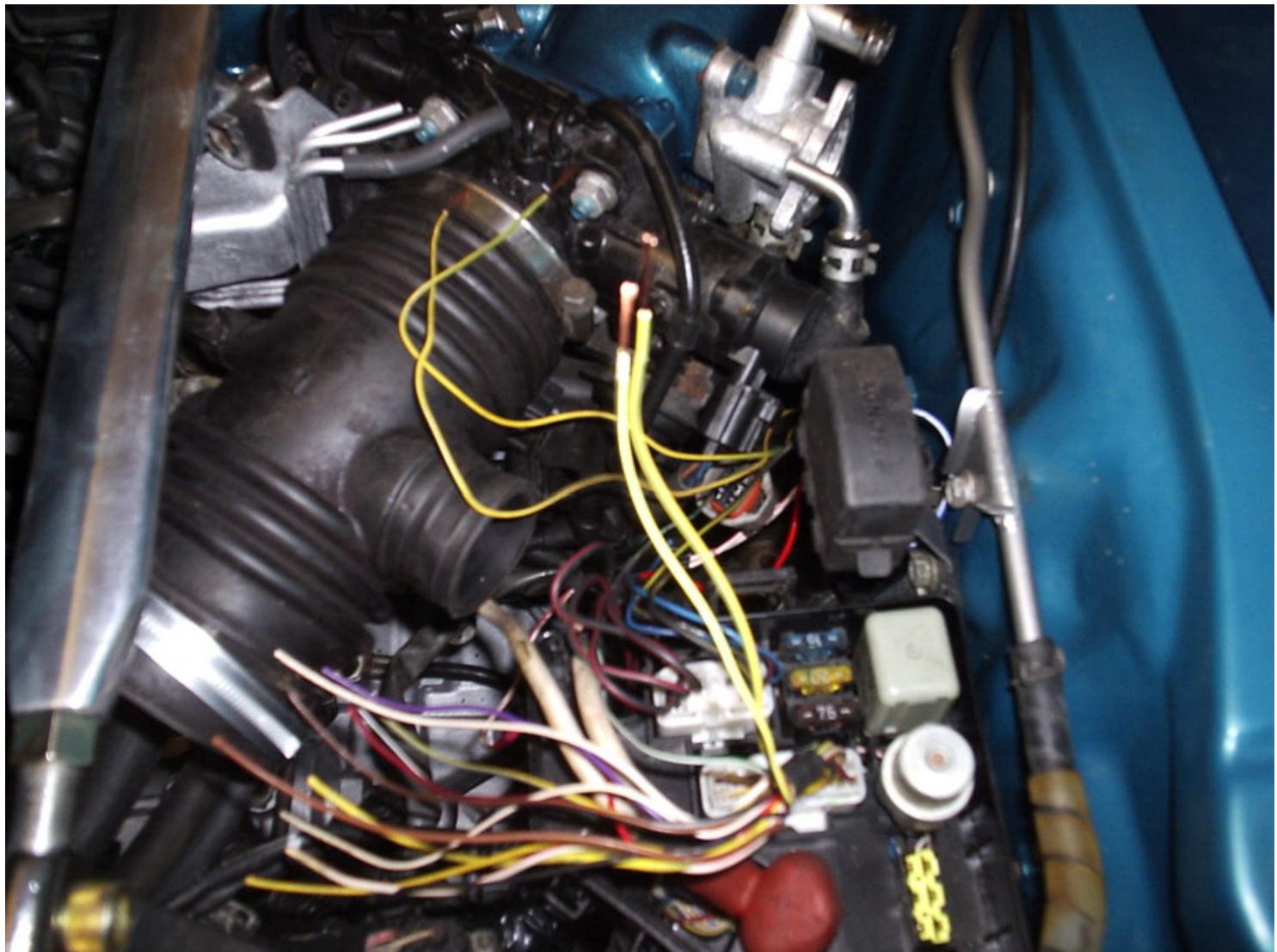


Signal wires for the dash:

The next two wires i like to do together, mainly because they run together in the harness and are easy to identify. They are the yellow/green (water temp) and yellow/black (oil pressure) wires....and can both be found here...



cut them both and route them through to the mk2 fusebox...



here you will find a yellow/green and a yellow/black coming from the mk2 fusebox to join them onto.....do i really need to say which wire goes where? Ah this is an idiots guide :) join yellow/green to yellow/green and join yellow/black to yellow/black.....doh!

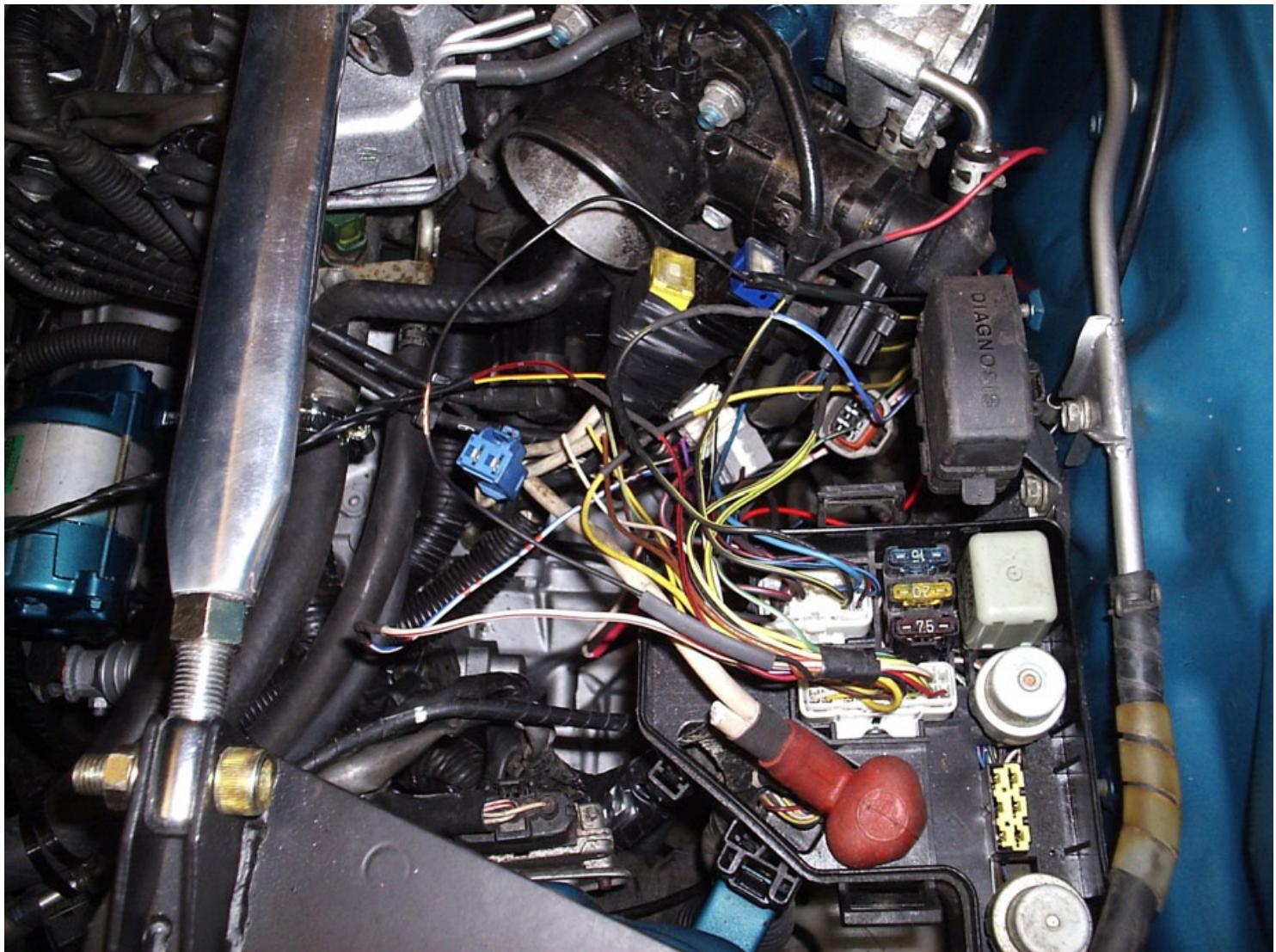
The earthing wire for the mk2 temp gauge is in the engine bay fusebox and sometimes its brown instead of the usual W/B toyota earth colour,simply earth this brown wire and also the W/B wire in the engine bay fusebox and the gauge will work.



The next wire is for the tacho on the dash, this is a black wire on one of the v6 white plugs in the boot....



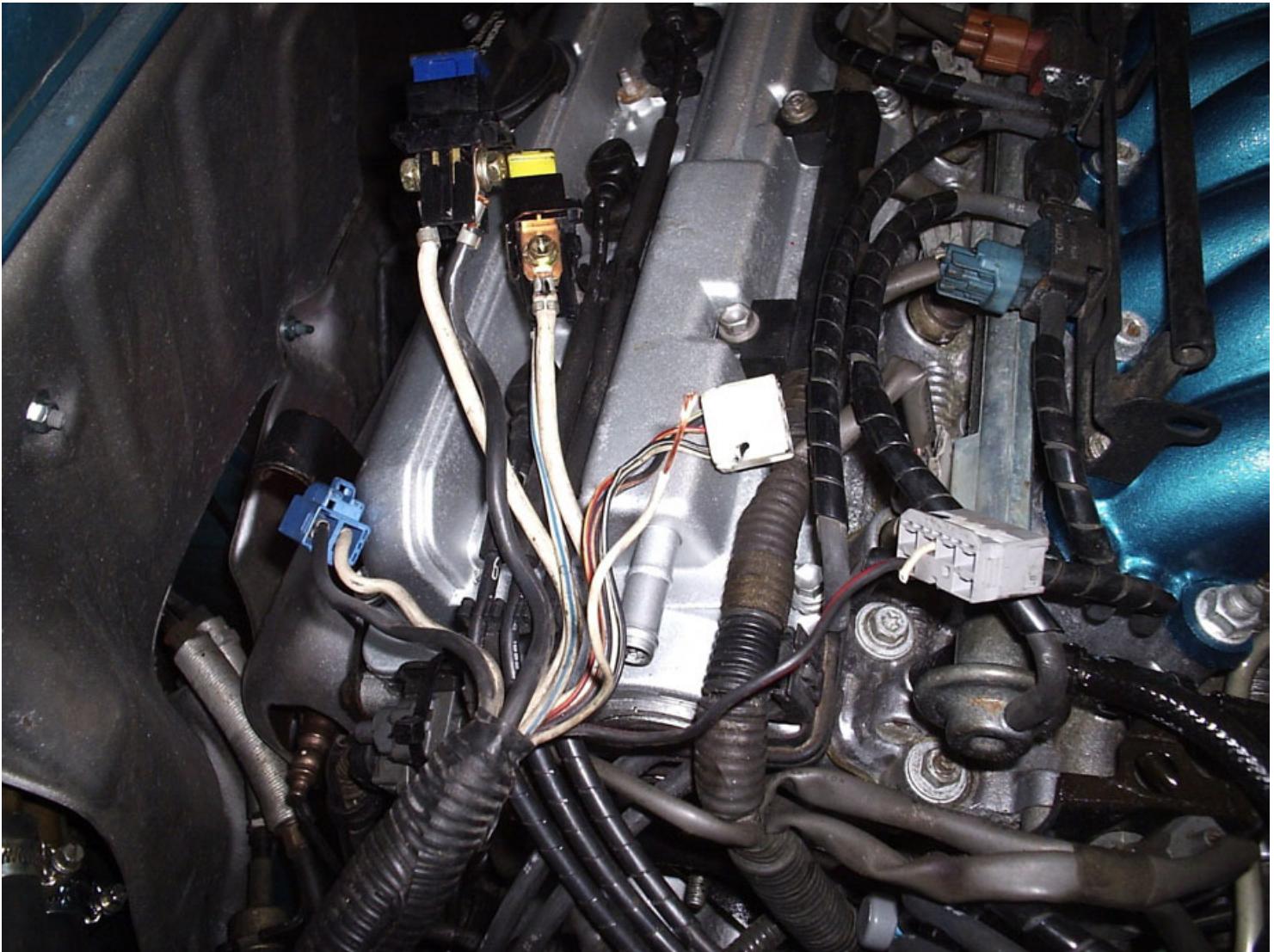
Again this needs cutting and routing through to the mk2 fusebox where you will find a black wire that it joins to, theres only one black wire so dont worry...



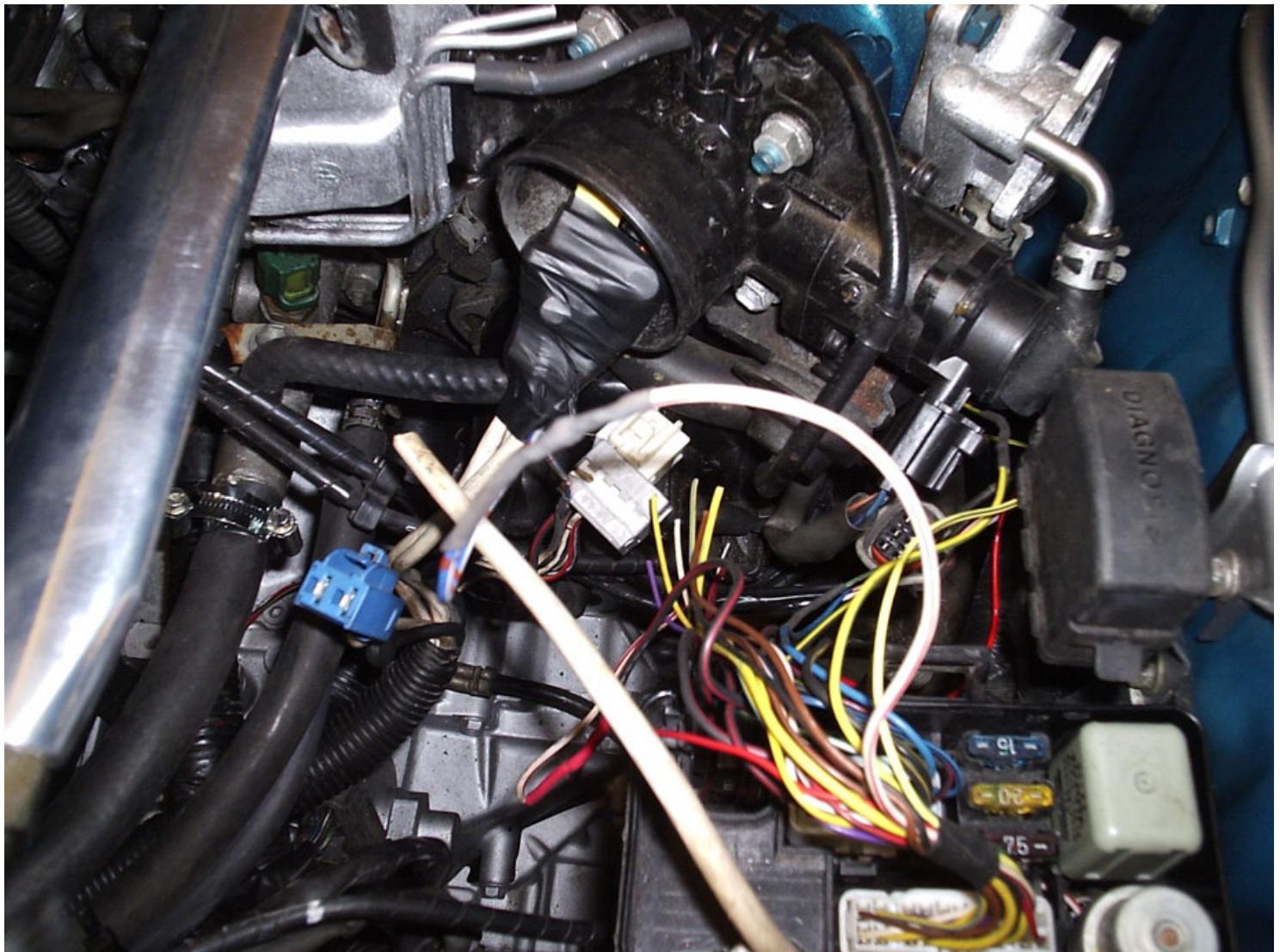
Here is the tacho wire connected, that's the last of the signal wires.

Alternator wiring:-

There are 3 wires on the v6 alternator multiplug ... starting with the white one, this exits the v6 loom where all of the v6 power cables are in the engine bay, it's on a grey plug near the blue and yellow fuse holders.... here's the wire cut from the plug, if in doubt do a continuity test between this white and the white on the alternator plug.

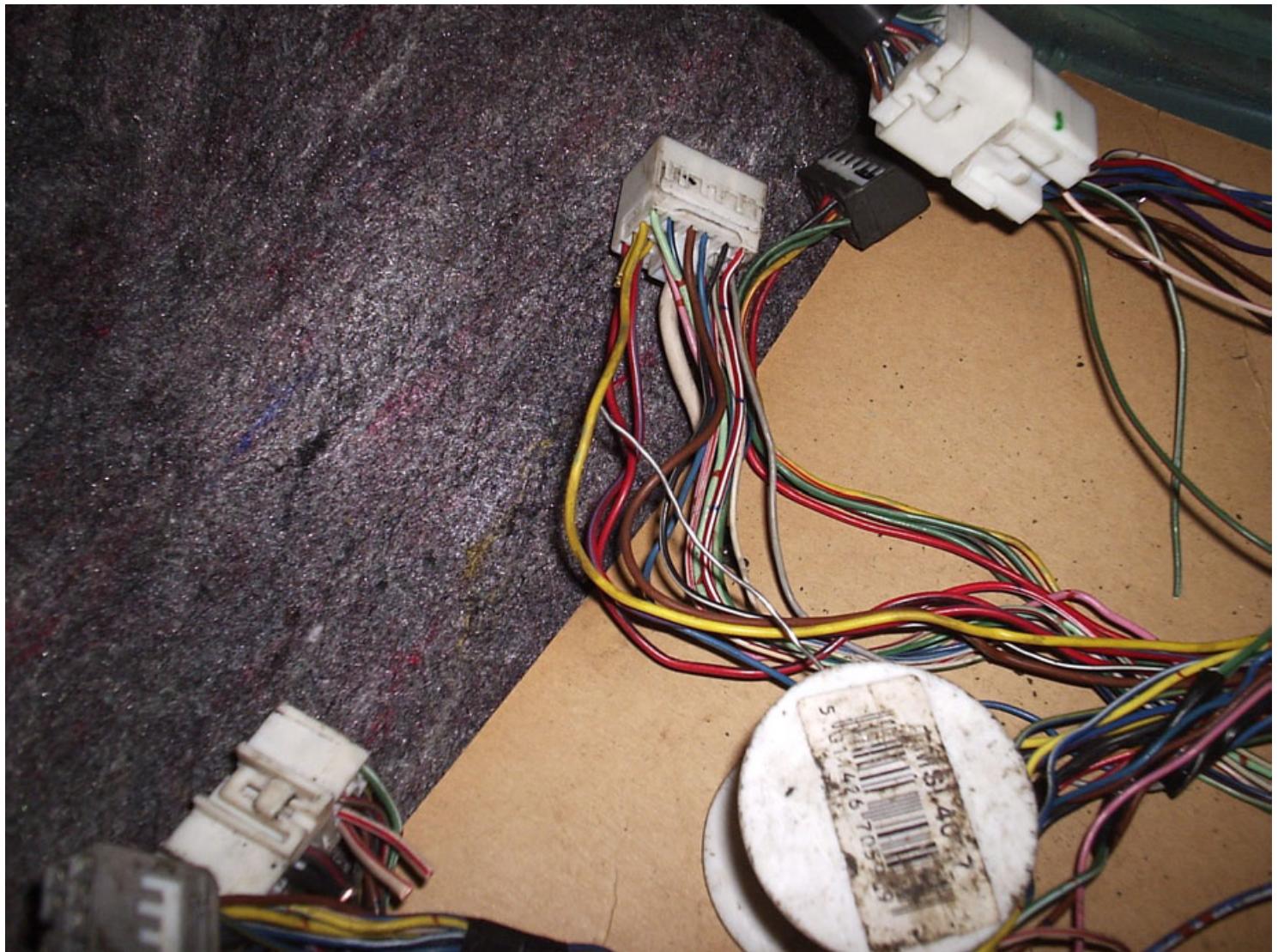


This white wire joins to a white/red wire in the mk2 fusebox (3s-fe) or in the boot of a 3s-ge,gte engined car.I had to extend this wire as it wasnt long enough to reach to the fusebox....

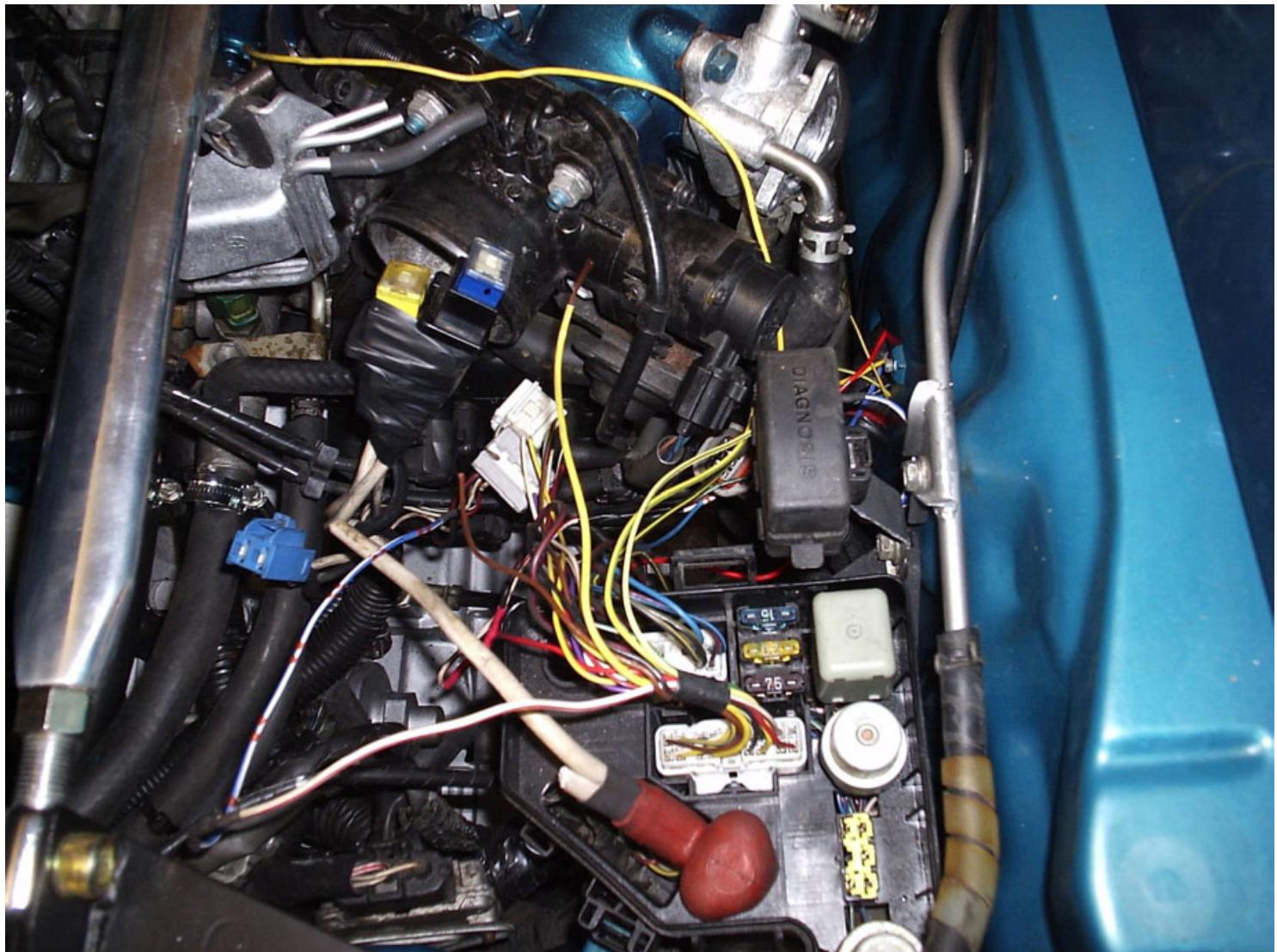


Here it is joined onto the white/red in the fusebox, this wire is a permanent battery live if it helps locate it.

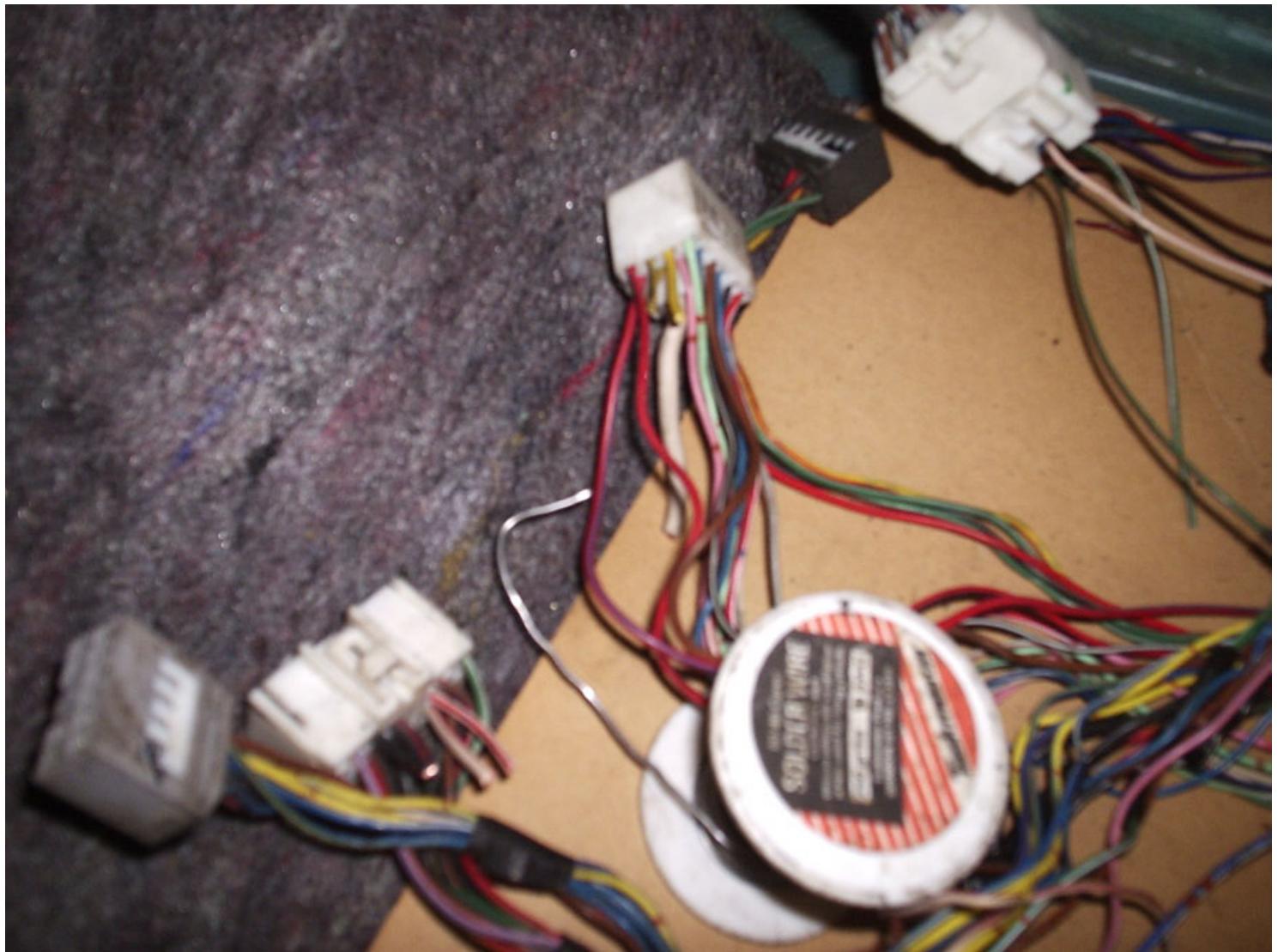
Next wire is the yellow one, this exits the v6 loom in the boot on this multiplug...



Again, cut it and route it through to the fusebox where it will connect to a yellow wire there. If in doubt about which yellow wire (there may be more than one) do a continuity test from the yellow wire you want to test back to the dashboard clocks.

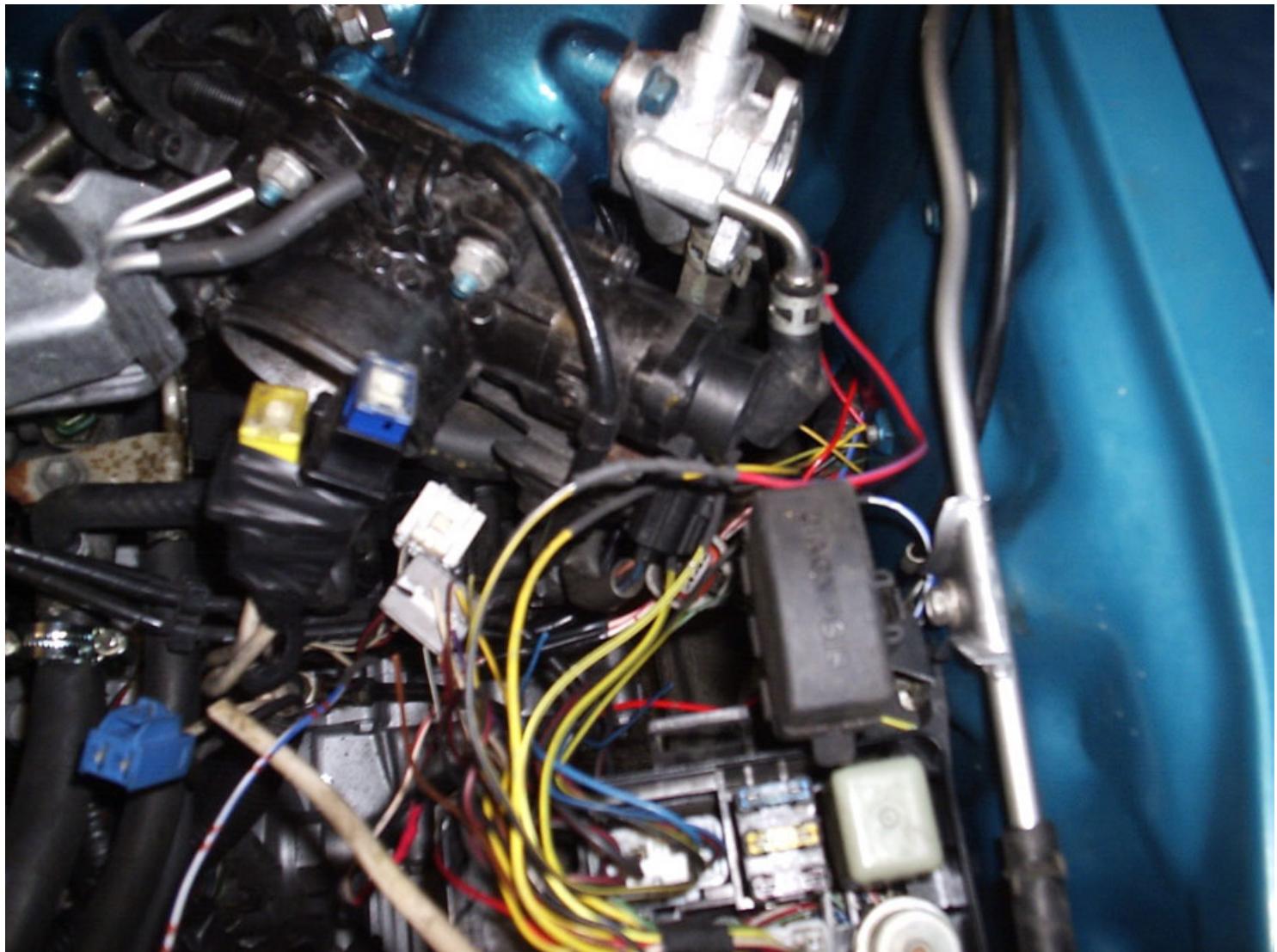


Heres the relevant yellow wire in the 3s-fe's fusebox. Last alternator wire is a red/blue one, this exits the v6 loom in the boot on this plug....



cut it here and route it through to the fusebox for connection onto a black/yellow ignition feed wire....

here it is connected,if in doubt use the EFI output wire which is also B/Y.



Thats the alternator wired up.

Wiring up an electronic speedo drive:

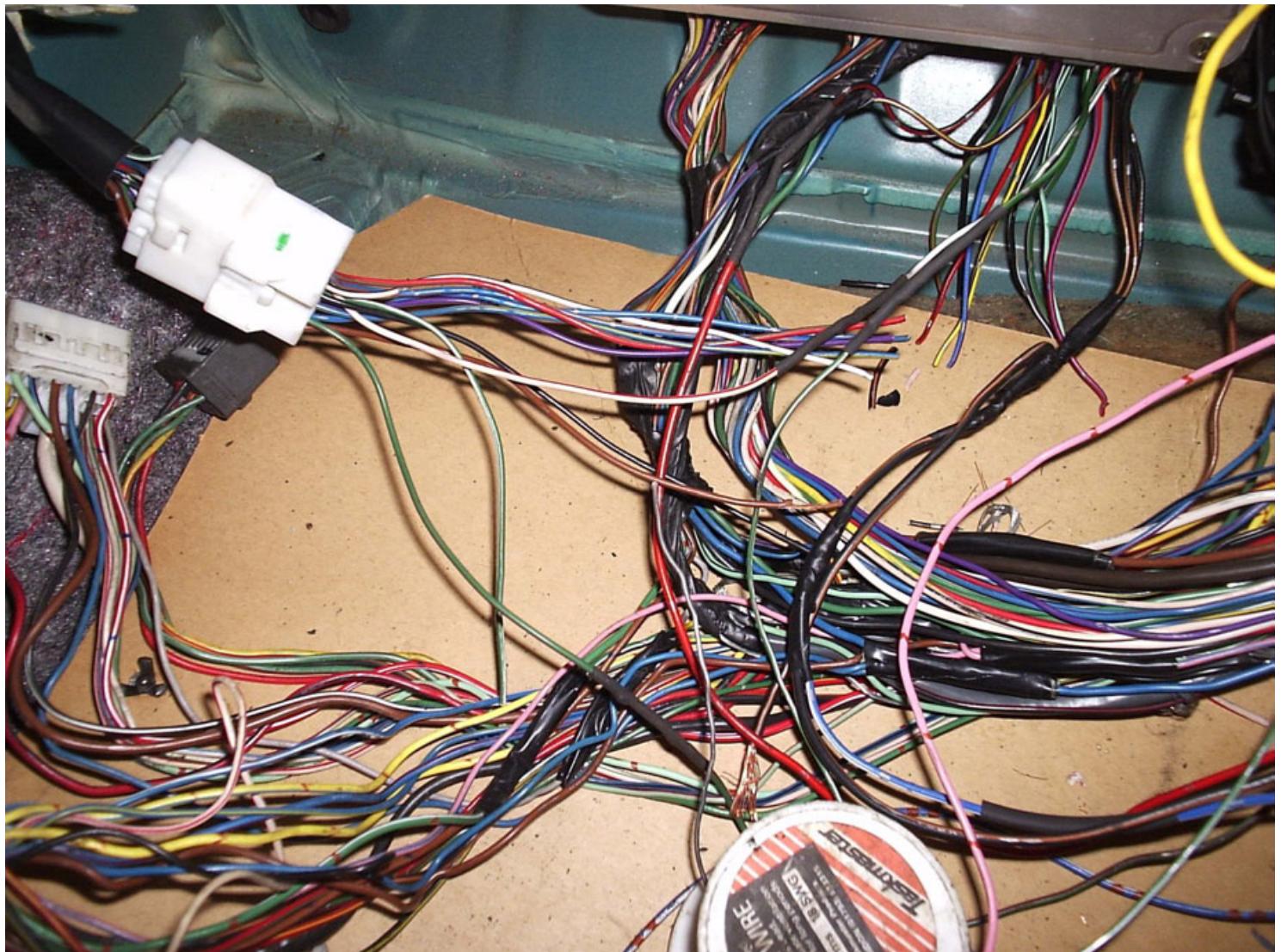
On some mk2's they have a mechanical speedo sender, if thats the case ignore this part and move on to the next section. For those that have electronic senders theres only 2 wires of the three to connect.

We use the v6 speedo sender plug and attach that onto the mr2 sender on the gearbox, its already in the right place and fits straight on! Thats a bit handy innit!! Now the red/blue wire on this plug already has power going to it so we dont need to worry about that.

Next wire on the speedo is a pink one, it exits the v6 loom in the boot here...

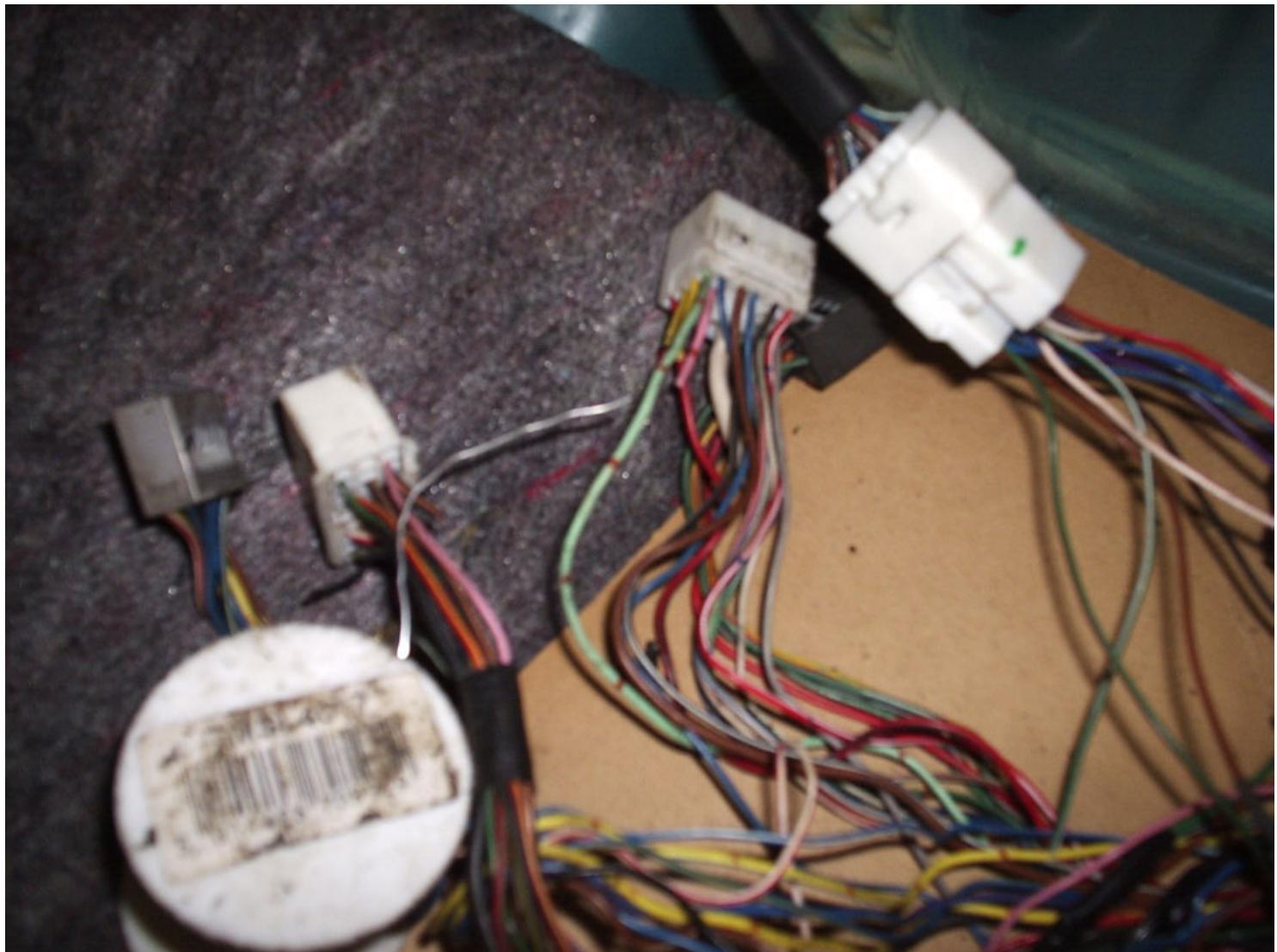


Cut it and it needs joining onto a brown wire that's usually in the mr2 boot on this connector....my solders pointing it out...

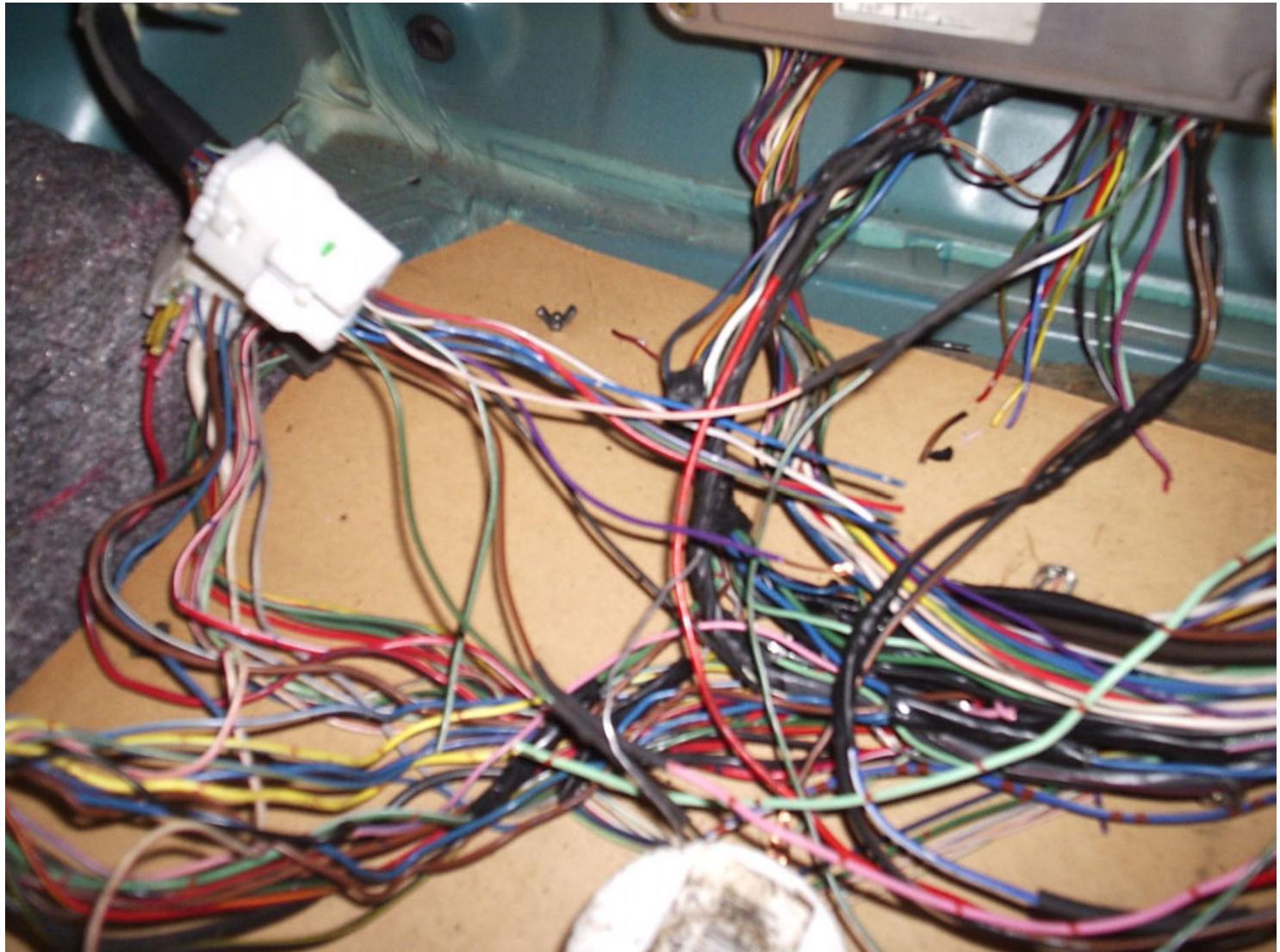


so join them together....

Next and final wire for the speedo is the light green wire, this too can be found in the boot on this v6 plug...



This wire needs connecting onto the purple wire that's also in the boot on the mk2 plug, solder pointing it out...

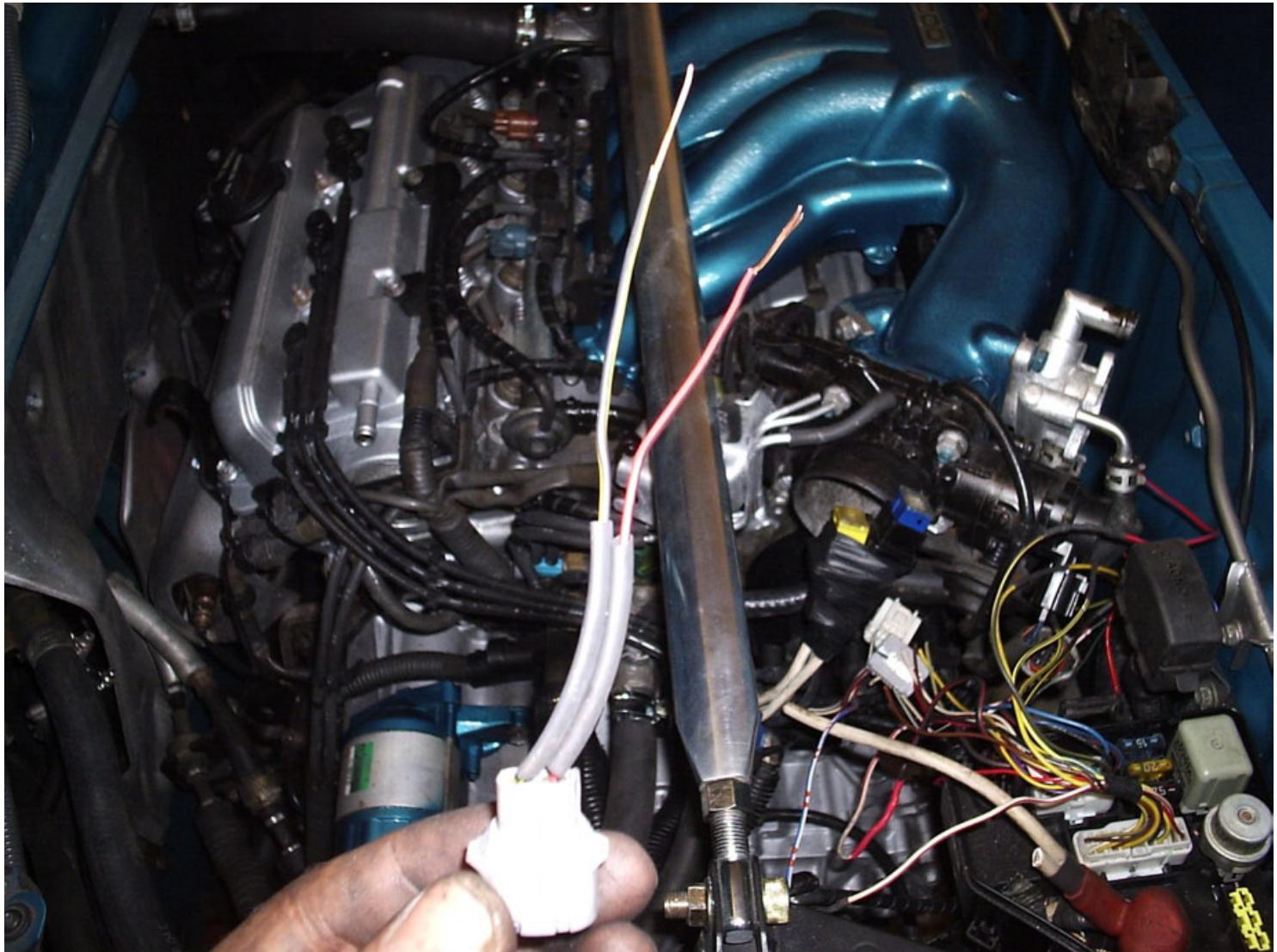


so join the light green to purple, job done....the speedo will now work.

Wiring the reverse lights up:

In ditching the original mk2 engine harness we have unwittingly binned the reverse light circuit too! Thats a bit naughty! So it needs wiring back up.

Chop the reverse light switch plug off your old engine harness, it has two wires in it, a black/yellow which by now you will all recognise as an ignition power feed, and a red/black wire....



this is the gearbox plug, the black/yellow wire goes to a black/yellow in the mk2 fusebox, the EFI output wire again if you like, as long as its a 12v ignition feed.

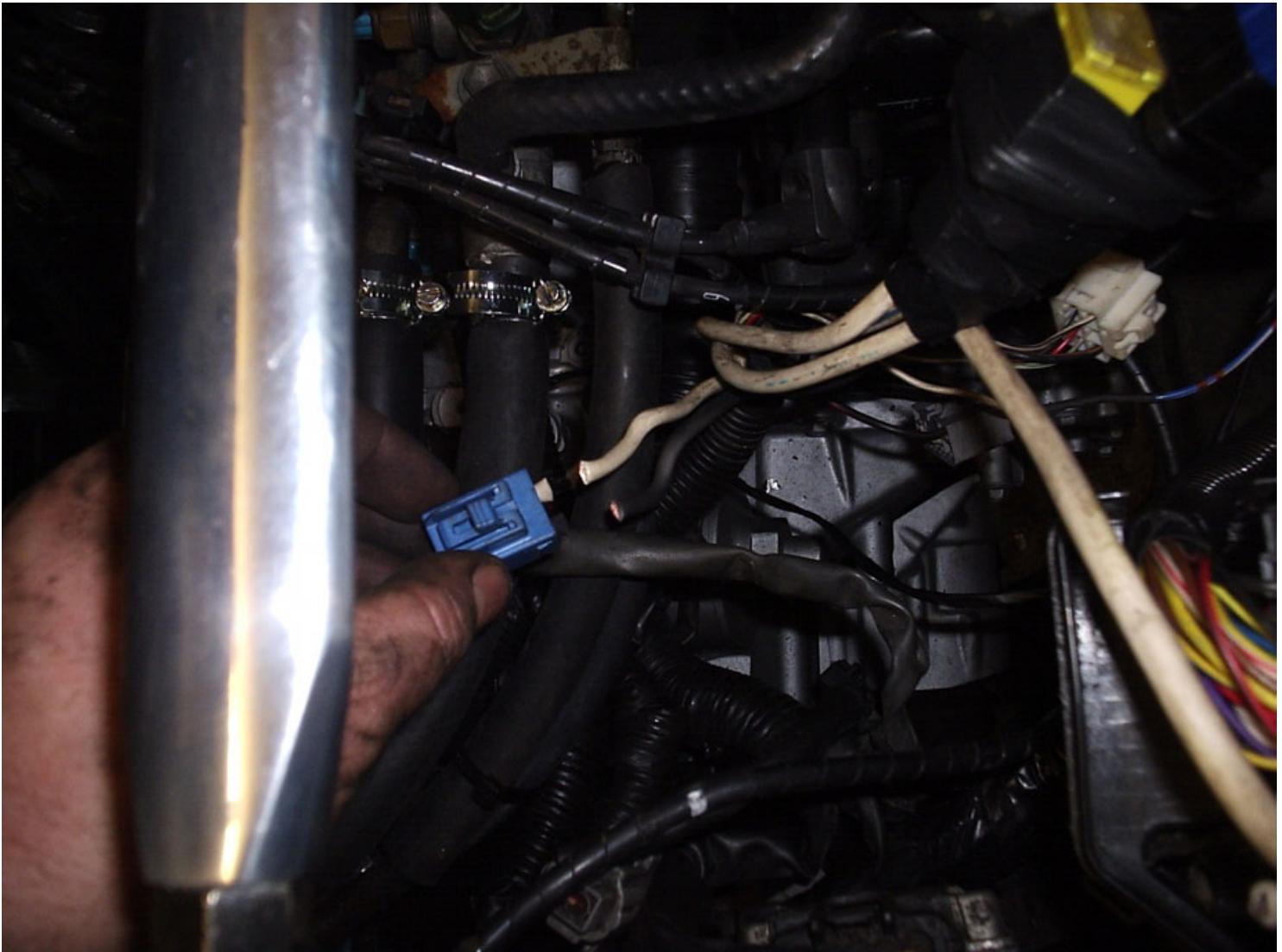
The red/black is the output wire for the reverse lights, this usually goes to the only red/black wire there is in the mk2 fusebox, in the case of the 3s-fe it didnt and i had a nightmare locating the reverse wire!! in the end it was in the boot plug and was a green/white wire, but this was 3s-fe only. In all other engine types its a red/black wire in the mk2 fusebox, if in any doubt run a continuity test between the suspect wire and the reverse light bulb holder.

Thats the reverse lights done.

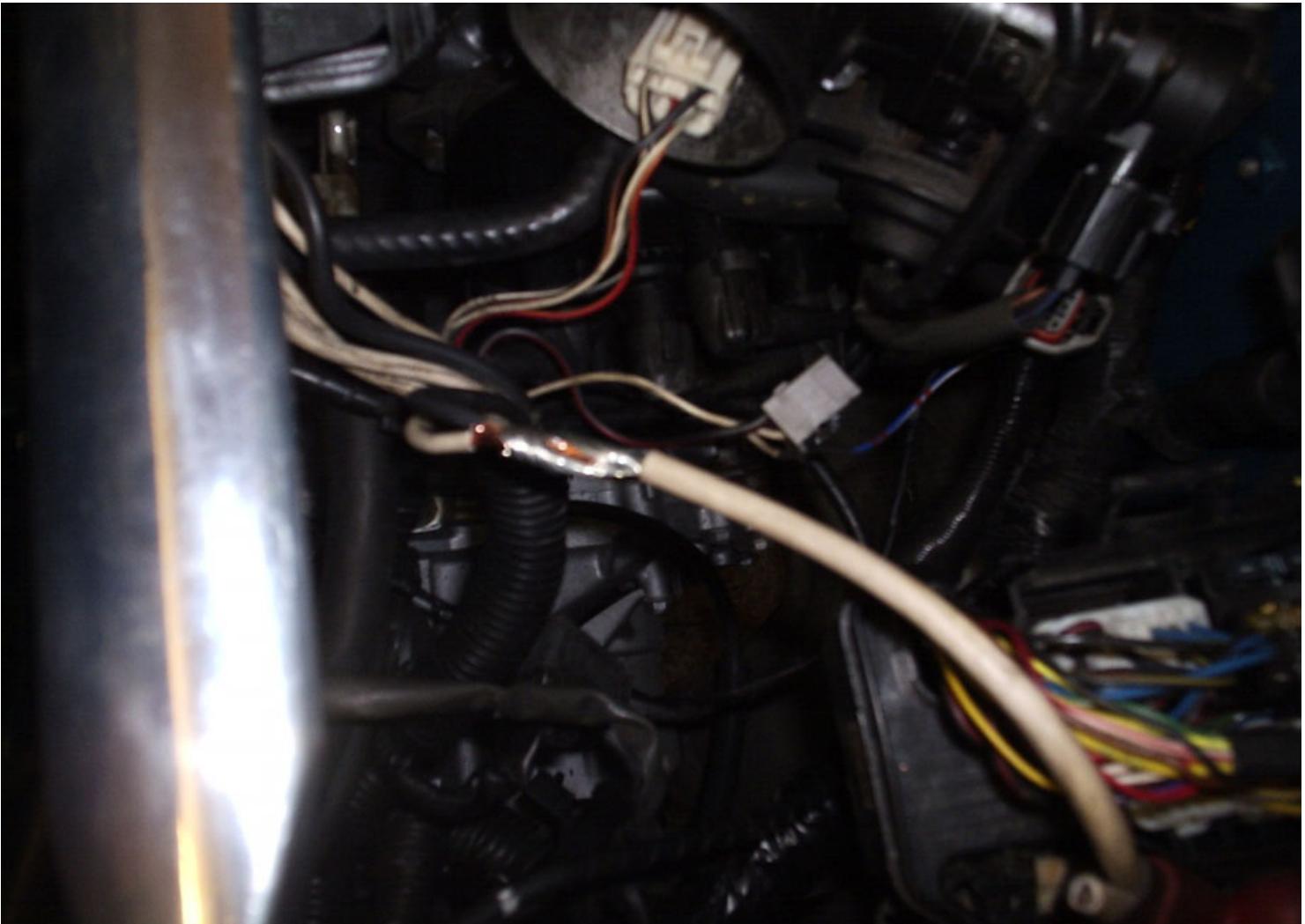
Powering up the mk2 fusebox:

We need to provide power to the mk2 fusebox from the alternator circuit, otherwise the battery wont charge and nothing will get power!

Theres a thick white wire on this plug in the engine bay, part of the v6 engine harness....



Its on this blue plug which also has a black wire on it,cut both wires and wrap them together,these will now attach to one of the thick white power cables in the mk2 fusebox...



This wire must be very heavily insulated. The other thick white coming from the mk2 fusebox you can just cut off and tape up, no need for it.

So that's the complete wiring taken care of... just a few extras to tell you about, if wiring up air con for the v6 swap there's a black/white wire in the fusebox that is the energiser for the AC clutch, wire this onto the new AC pump clutch wire which can be found on the v6 harness, run a continuity test to locate it.

Also there's a white/black earth wire in the mk2 fusebox, take this wire straight to earth, it controls the earthing for the temp gauge on the clocks, if left unconnected the gauge shoots to hot everytime.

Hopefully I've not made any errors on this write up, please read the disclaimer again and understand this guide is just that.... a guide, please test every wire for yourself, if nothing it will give you an insight and understanding into how your car is wired and how it works for future fault finding.

If in any doubt about anything drop me a PM on the forum and I'll tell you to F off :0)

Woods out.